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## THE SURGICAL TREATMENT OF HYPERTENSION\*

### *17 Years in Retrospect*

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HYPERTENSION is one of the most deadly maladies affecting the human race today. Its incidence appears to be increasing. It is said to cause four times as many deaths, directly or indirectly, as all forms of cancer. In some cases it follows a fulminating, irreversible, incurable course. In others, its onset is insidious, and its course slowly progressive with apparently long periods of stabilization at some particular point.

For the past seventeen years we have been interested, not only in the medical care of this disease but its surgical treatment. It is my privilege today to present a small series of cases treated surgically and followed postoperatively for not less than two years. We offer no apology for the small number of cases presented as it is from choice rather than from lack of opportunity. During this period we have treated a great number of hypertensives medically. The series of 34 cases presented today is an indication of the great care taken in selecting our cases for surgical treatment. Any reference to etiology, medical therapy or selection of cases for operation has been purposely omitted. These phases have been so well discussed in numerous papers that we feel it would be merely repetition of facts with which you are conversant.

In the past 17 years 34 cases have been operated upon and their progress followed for from two to 17 years. There were four male and 30 female patients. During that time nine have died (Table I). One patient died of cancer one year following operation and is excluded from our series. A second patient died an accidental death two and one-quarter years postoperatively,

having had a very satisfactory result up to that time.

We have had two postoperative deaths. One patient died of an atelectasis followed by pneumonia. Another died of kidney failure due to the use of sulfonamides.

TABLE I.

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34 cases—followed for 2 to 17 years.
Dead, 9 cases, 26.5%.
Living, 25 cases, 73.5%.
Cause of death.
1 cancer, 1 year (excluded).
1 accidental death, 2¼ years p.o.
2 postoperative 5.8%.
1 atelectasis and pneumonia.
1 kidney failure (sulfa drugs).
5 result of hypertension.
1 coronary thrombosis, 8 years.
3 heart failure 8, 4, ½ years.
1 stroke, 4 months.

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In addition to these four deaths five have died in the intervening years as a result of their hypertension. One died with a coronary thrombosis eight years postoperatively. At the time of her operation she was 37 years old, had a blood pressure of 255/145, fundi grade III, an enlarged heart, and the electrocardiogram showed coronary sclerosis. In our summary she is classified as a poor result.

Three patients died of congestive heart failure. One of these cases is worthy of note. She had a resting blood pressure preoperatively of 230/140, fundi grade III, enlarged heart and coronary sclerosis. She suffered from intense headaches and had been refused surgical treatment elsewhere. Her fundi had been reported as damaged beyond repair. We operated upon her at her family's request after carefully explaining the limitations of surgical treatment in her case. For six years she led a moderately comfortable life, at the end of which time she had her nodular thyroid removed by another surgeon. Two years later she died of congestive failure.

One patient died of massive cerebral hæmorrhage. She was 35 years of age, and had a preoperative resting blood pressure of 300/195. Her

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fundi were grade III. She made an uneventful recovery following her first operation. She was readmitted four months later for her second operation and died the night before operation.

What constitutes a good result in the surgical treatment of hypertension? In our opinion this is a question of no small magnitude. We can justifiably estimate our success and base our conclusions on two factors: (1) The sustained decrease in diastolic blood pressure over a number of years. (2) The symptomatic relief obtained by the patient.

Smithwick<sup>1</sup> has given us a practical guide based on sustained fall in diastolic blood pressure following operation, Table II. We have used

TABLE II.

SMITHWICK'S GRADING OF RESULTS IN HYPERTENSIVE SURGERY			
1. Good	—	Diastolic B.P. lowered	30 mm. Hg. or more.
2. Fair	—	" " "	20 - 29 mm. Hg.
3. Poor	—	" " "	10 - 19 mm. "
4. Unchanged	—	" " "	0 - 9 mm. "
5. Worse	—	" " "	higher.

this method in our series. It has many faults. It is a purely mechanical grading. No allowance is made for the number of years of sustained drop in the diastolic blood pressure or for the severity of the disease. It in no way indicates the overall picture of the patient preoperatively or post-operatively. Our remarks are not to be construed as a criticism. When one criticizes, one should have an alternative to offer and at the present time we have no definite scheme which in our opinion would be better than that offered by Smithwick.

Our own results, followed from two to seventeen years, are shown in Table III. This shows

TABLE III.

END RESULTS OF 33 CASES FOLLOWING SURGICAL TREATMENT FOLLOWED FROM 2 TO 17 YEARS					
Smithwick's classification		Our results			
		No.	%	Average drop	Average year
30 mm. Hg. + . . . . .	Good	9	27.3	41.2 mm. Hg.	6.3
20 - 29 mm. Hg. . . . .	Fair	6	18.2	26.3 mm. Hg.	5.5
10 - 19 mm. Hg. . . . .	Poor	7	21.1	12.8 mm. Hg.	6.4
0 - 9 mm. Hg. . . . .	Unchanged	3	9.1	—	—
Worse . . . . .		8	24.2	2	2

that nine cases or 27.3% have been classified as good. The average drop in diastolic blood pressure in these cases is 41.2 mm. of mercury, and the average number of years of maintained drop

of diastolic blood pressure is 6.3 years. Six cases, or 18.2%, were classified as fair and have maintained an average drop in diastolic blood pressure of 26.3 for an average of 5.5 years. Seven cases, or 21.2%, are classified as poor results. These cases have maintained an average drop in blood pressure of 12.8 over an average of 6.4 years. Three cases are unchanged and the remaining eight cases, or 24%, are dead. This latter figure includes operative deaths.

TABLE IV.

RETINAL CHANGES FOLLOWING SURGICAL TREATMENT 27 CASES FOLLOWED			
		Abbott	Smithwick
Improved . . . . .	10	37%	41%
Same . . . . .	17	63%	39%
Worse . . . . .	0	0	20%

Symptomatically our cases have done much better than one would have expected from the drop in diastolic pressure. Our conclusions are based on the patient's relief from headaches, from that full sensation in the head from which they suffer so much, and from visual disturbances; and a general feeling of wellbeing in contrast with one of general lassitude and fatigue. Some of our cases that have had very little drop in blood pressure have done remarkably well symptomatically.

In 27 cases we have followed the changes in the fundi following operation, Table IV. We have been fortunate in finding no case develop papilloedema and hæmorrhages following operation.

We have followed 26 cases and have found no improvement in the heart by electrocardiographic studies, Table V. Twenty have remained

TABLE V.

ELECTROCARDIOGRAPHIC STUDIES IN 26 CASES FOLLOWED 2 - 17 YEARS		
Improved	Same	Worse
0	20	6

stationary and six have become worse.

It is of interest to consider some of our cases that are still living although classified as poor results. These cases are classified by Smithwick's method of grading, according to the drop in diastolic blood pressure, Table VI.

TABLE VI.

3 POOR RESULTS BASED ON SMITHWICK'S DIASTOLIC B.P. CRITERIA				
Sex	Age	Date of operation	B.P.	B.P. 1951
1—Male...	30	1934	165 110	150 100
2—Female..	35	1935	210 120	220 120
3—Female..	48	1941	240 140	240 120-130

CASE 1

Our first operative case. Before operation he was unable to carry on his usual occupation as a salesman. Seventeen years later he holds the rank of office manager. He is well, his blood pressure is still ten points below his preoperative diastolic level.

CASE 2

Female, age 32. This girl had a right-sided hemiplegia in 1934, with complete recovery except for repeated cerebral seizures—sometimes daily. For the past 15 years she has earned her living as a practical nurse. Her seizures have averaged about one a year. On occasions she has had some myocardial failure requiring hospitalization. For the past year she has required a fair amount of financial assistance but still works part time.

TABLE VII.

No.	Sex	Age	Operation	B.P.	Fundi	Heart	Cerebral**
1	Female	37	1938	255/245	III	Enlarged. Angina	Headaches
	Lived eight years. General condition and headaches much improved. Died with coronary thrombosis, 1946						
2	Female	46	1941	230/140	III	Enlarged. Angina	Headaches
	Thyroidectomy 1946. Died 1948, congestive heart failure.						

CASE 3

Female, age 48. We saw this patient first in 1940. At that time her blood pressure was 240/140, fundi grade III. She had cardiac enlargement and suffered from anginal attacks. We refused surgical treatment at that time. One year later we re-considered her case and operated upon her. For nine years she lived in comparative comfort. In February 1950, she consulted her physician on account of dyspnoea, some leg oedema and moderate Rombergism. Her blood pressure was 220/120. A diagnosis of luetic heart disease was made. During the past year she has received appropriate treatment for her lues. She has at the present time well marked congestive failure and is quite ill. Her blood pressure averages about 240/120.

Two cases now dead illustrate the difficulty in classifying good and poor results, Table VII.

CASE 1

Female, age 37. She had a preoperative blood pressure of 255/145, fundi grade III. She had severe headaches, cardiac enlargement, and had one attack of coronary thrombosis. Following operation she lived eight years in comparative comfort. She died of a second coronary thrombosis. Her blood pressure shortly before the time of her death was 240/140.

CASE 2

Female, age 46. Her preoperative blood pressure was 220/140, fundi grade III. She suffered from coronary sclerosis and angina, had an enlarged heart, and very severe headaches. She made an uneventful recovery following operation. Six years later she had her thyroid removed in another clinic. She died of cardiac failure in 1948, two years later.

Careful consideration of these cases and other similar ones lead us to believe that these cases are really not poor results. The surgical treatment has been of real value symptomatically, and has prolonged their lives. We, therefore, feel that some more comprehensive plan must be devised to classify the end result of surgery of hypertension.

Table VIII illustrates some of our good results. Case 2 is of considerable interest. She worked in a war plant in Eastern Canada for two years following her operation with a normal blood pressure. She returned to Winnipeg, married and went through her first pregnancy with a normal blood pressure. Her second pregnancy was terminated when her blood pressure went up to 150/100. At the present time she has stabilized around 160/100, and is in good condition.

Case 5 was a lady school teacher referred to us because of hypertension. She was having difficulty in carrying on her work at school. She had constant severe headaches and great fatigue. At the present time she carries on her old profession, is in excellent health, and is symptom-free.

During our 17 years of experience with hypertensive surgery our technique and our approach has gradually changed. Originally, we used the technique of Craig,<sup>2</sup> that is, the sub-diaphragmatic approach. In 1942, we adopted the tech-

TABLE VIII.

SOME EXCELLENT RESULTS				
Sex	Age	Operation	B.P.	B.P. 1951
1—Female...	41	1941	225/120	160/84
2—Female...	21	1942	220/135	160/100
3—Female...	42	1943	230/140	170/90
4—Female...	42	1945	230/130	170/80
5—Female...	31	1946	210/120	120/84

nique of Smithwick.<sup>3</sup> Four years later we began using the transpleural route. This approach gives excellent exposure of the thoracic chain and the splanchnics but the lumbar chain is not exposed with ease below the diaphragm. It is time-consuming and traumatic. For the past year we have used a combined lumbar and transpleural approach. The sub-diaphragmatic part of the dissection, that is, the sub-diaphragmatic portion of the splanchnic nerves and lumbar ganglia 1, 2, and 3, are done through a lumbar incision. This gives excellent exposure, is much less traumatic than splitting the diaphragm, and permits a bloodless dissection of the splanchnic nerves and lumbar ganglia with perfect vision. The average time for this dissection is somewhere in the neighbourhood of 40 minutes. This incision is closed without drainage. The chest is then opened between the 7th and 8th, or 8th and 9th ribs by a simple intercostal incision. In older patients we shingle the rib above, great care being taken not to injure the accompanying nerve. In younger patients we leave the ribs intact. This approach gives excellent exposure.

The thoracic chain from D-4 to D-12, together with the three splanchnic nerves are removed in one piece by a meticulous block dissection, great care being taken to remove all fine nerve filaments found passing to the aortic plexus in some cases. This double incision in our opinion is far superior to all other approaches so far described.

Before closing, a small stab wound is made posteriorly and below our intercostal incision between the 9th and 10th rib. A rubber catheter, F. 22 to 24, is inserted through this small stab wound for suction. The chest is then closed with chromic catgut including three tension sutures of No. 2 chromic threaded through drill holes in the ribs above and below the intercostal incision. This manoeuvre has practically eliminated postoperative nerve pressure. Interrupted silk sutures are used for closing the skin. Before dressing the wound all air is aspirated from the chest allowing complete expansion of the collapsed lung. The catheter is then clamped and left *in situ*. When the patient returns to the ward the catheter is attached to a mercury safety lock suction machine and the clamp removed. A negative pressure of approximately 9 cm. of water is maintained for several days, usually four or five, during which time we recover on the average about 400 c.c. of blood and serum. This eliminates troublesome collection of fluid

in the pleural cavity, and the necessity of post-operative chest x-rays and aspirations. It is a great comfort to the patient. We have been so impressed with this simple procedure that we now use it routinely not only in this connection but for gastric resections, œsophagectomies, diaphragmatic hernias and other procedures approached through the thorax.

#### CONCLUSION

We believe that lumbo-dorsal sympathectomy is a very worthwhile procedure in a small percentage of hypertensive patients. It is not to be considered a curative procedure. It does, however, in some cases return the blood pressure to normal for many years, in a larger percentage of cases it arrests the progress of the disease, improves or arrests retinal changes and it is said to protect the kidneys and lower the incidence of cerebral accidents. Palmer has compared the medical treatment with the end result of splanchnic resection for hypertension and has shown that it definitely prolongs life in contrast with cases treated by medical care only. Symptomatic relief in many cases is striking. Is this not a more justifiable procedure than of œsophagectomy for carcinoma, upper abdominal evisceration for carcinoma of the head of the pancreas, and many of the other radical procedures advocated and widely carried out by surgeons today?

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CLINICAL EVALUATION OF CORTICOTROPIN THERAPY IN CHILDREN.—Twenty-eight children were treated with corticotropin for 4 to 109 days and received 15 to 2,885 mgm. total dose. Favourable results were obtained in Sydenham's chorea (2 cases) rheumatoid arthritis (2 cases), bronchial asthma (3 cases), the nephrotic syndrome (3 cases), eczema, dermatitis venenata and anaphylacoid purpura (6 cases). Acute and subacute lymphatic leukæmia initially showed very good temporary response to corticotropin therapy, but this was followed by exacerbations. Acute and chronic glomerulonephritis, Wilson's disease, and polymyositis did not show favourable changes. Side effects were noted in a few of the cases studied, these were Cushing's syndrome, transitory elevation of the blood pressure, thrombocytopenic purpura, convulsions, with pulmonary oedema, acne and mild hirsutism. The oedema associated with Cushing's syndrome was controlled by restricting the dietary sodium. The optimal dose was 15 to 60 mgm. per day divided into 6 or 8 hourly doses.—Kreidberg, M. B., Cleroux, A. P. and Rosenberg, I. N.: *J. Pediat.*, 39: 397, 1951.

## ABDOMINAL AORTOGRAPHY IN UROLOGY\*

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DON SANTOS of Portugal was the first to carry out translumbar aortic puncture for abdominal arteriography. The result of his two years' work was published in 1929. It has, however, come into use very slowly and little or nothing was reported until 1942 when Nelson and Doss, working independently, brought out optimistic reports on a considerable series of cases. Nelson has added several articles and more recently there have been papers by Parke-Smith and by Griffiths. They all stress the simplicity and safety of the procedure. Griffiths states that series involving many thousands of cases have been published without reporting a single fatality. It is possible that there have been deaths which

have not been reported, but there have been no deaths in centres where large numbers of cases have been done.

In 1936, Henline and Moore published an experimental report on aortography in animals using sodium iodide. They concluded the method was unsafe and this may be one reason why it has never been widely used. More recent work by Melick and Byrne confirms Henline's conclusions. They have shown that 80% sodium iodine injected into the superior mesenteric artery of dogs causes a very acute inflammatory reaction followed by gangrene. They then tried a series of various newer compounds commonly used as urographic media and found much less reaction with all of them. There was virtually no reaction from Urokon and they concluded that this is the safest of all. The drug is still limited to investigational use.\* In our experience it has

\*From the Departments of Urology, Queen's University and Kingston General Hospital.

\*The Urokon was made available by Mallinckrodt Chemical Works Ltd.

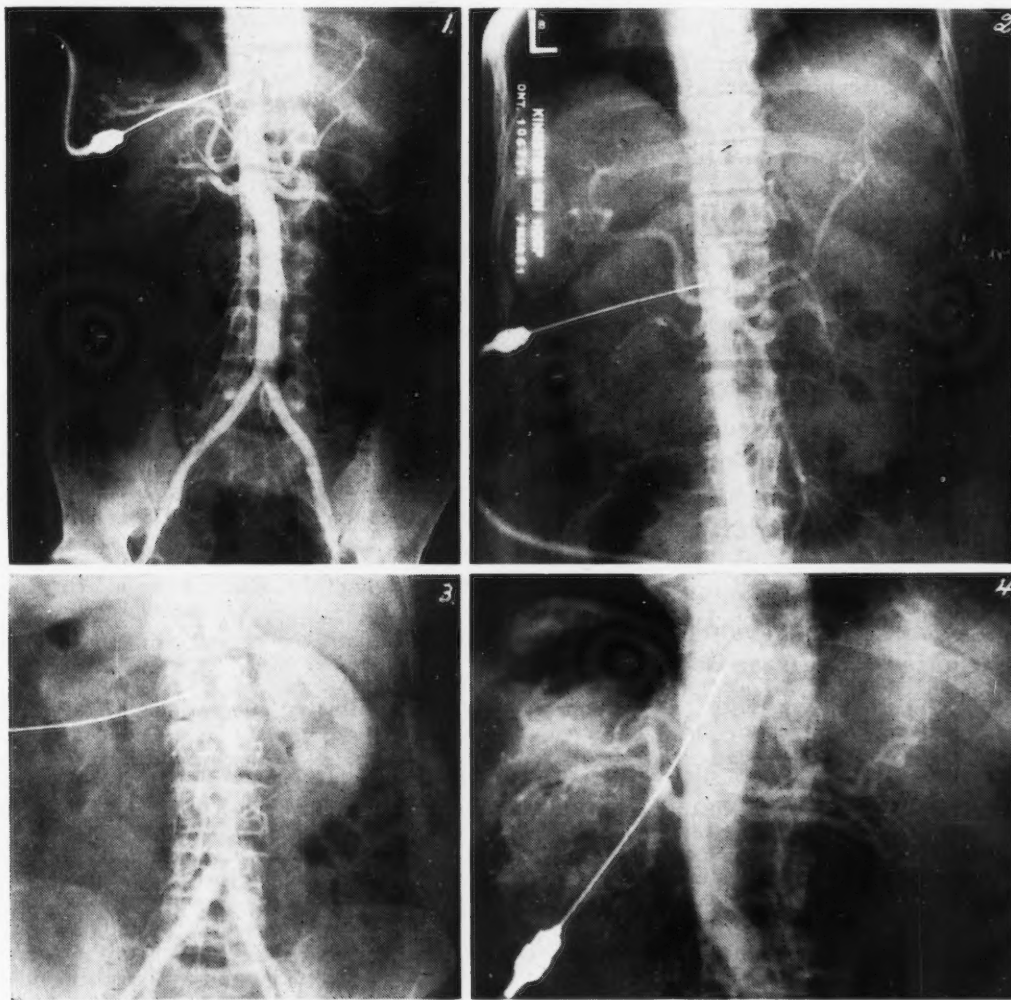


Fig. 1.—Normal aortogram showing all the great vessels of the abdomen and pelvis. Fig. 2.—Functionless left kidney due to carcinoma cervix. The left renal artery is much smaller than right but the kidney still has a considerable blood supply—probably a "medullary shunt". Fig. 3.—Renogram of remaining half of horse-shoe kidney. Fig. 4.—Aortogram of kidney tumour showing pooling or laking in region of lower pole. Note arteriosclerotic changes in aorta.

been the most satisfactory medium. We have had no untoward reactions with this drug.

While mesenteric thrombosis occurs in humans using sodium iodide, it is certainly rare and, since gangrene has followed its use so consistently in dogs, it would appear that any medium which caused little or no reaction in dogs would have a wide margin of safety in humans.

It may be that the danger of sticking needles into the aorta is more apparent than real or possibly it is that the procedure looks more difficult than it really is. At all events we thought about it for a long time before we really undertook it seriously, and now we feel we can safely offer it to anyone. Figs. 1 and 2 show that it is possible to puncture the aorta fairly accurately and that no damage results.

The actual technique is simple. All that is required is an 18 gauge needle, 12 cm. long, a suitable 20 c.c. syringe with a piece of rigid tubing about 6" long and adapters for positive connections on each end. It is an interesting fact that while many investigators originally used more complicated methods they have all discarded them for this simpler technique. After a preliminary scout film the patient is turned on his face, anaesthetized with pentothal, and the left side of his back given a surgical scrub. The needle is then inserted at the lower edge of the 12th rib, three to four fingers breadth from the midline. It is advanced ventrally, superiorly and medially to the body of the 12th thoracic vertebra. It is, of course, not always possible to locate this exact vertebra and it may go a bit higher but it should not be lower. Having located this the needle is withdrawn and moved forward until it just slides in front of the body of the vertebra when the aorta is distinctly felt as the needle pierces it. After a little experience one does not always feel for the body of the vertebra—one goes directly to the aorta. The blood does not spurt from the needle.

We inject the contrast medium while the operator counts quickly "one thousand one, one thousand and two, one thousand and three". The film is exposed as he says three. 1/25th of a second exposure is usually advised, but equally good films are possible at 1/15th or 1/20th sec. A second film exposed two seconds later will give an outline of the kidney or nephrogram such as can be obtained in no other way. Films given 5 to 10 minutes later give an excellent

excretory urogram. 10 to 20 c.c. of the medium is injected. The smaller amount is usually enough to visualize the vessels of the upper abdomen. If the pelvic vessels are to be shown it is better to put in the larger amount and count a little more slowly. The injection should be a little more rapid in hypertensive patients and a little slower in patients with very low pressures.

Teamwork and absolute precision are necessary. One assistant gives the anaesthetic and a second is ready to inject the iodide as soon as the surgeon places the needle; while the technician stands ready at the controls. A slip at any point and the whole thing is a failure. It is, however, accompanied by little reaction and patients

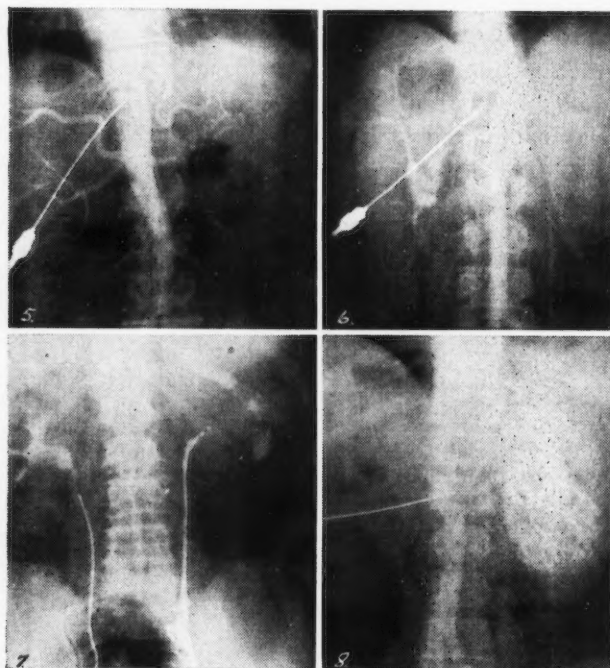


Fig. 5.—Mass in both loins thought to be polycystic kidneys. Large avascular area right due too a cyst. Hydronephrosis left. Fig. 6.—Splenogram. Fig. 7.—Pyelogram from a case of suspected tumour in which the case showing defect characteristic of tumour making the diagnosis remained in doubt. Fig. 8.—Aortogram of same diagnosis conclusive. The right renal artery only has been injected.

do not object to a repeat examination. Ridiculous as it sounds we agree with Nelson that it is actually simpler than doing a pyelogram and accompanied by no more reaction. The consensus appears to be that the compounds used for intravenous urography in 70% concentration are safer than sodium iodide, and while we had little trouble with iodide sensitivity—one patient had some salivation and vomited, while a second had a feeling of fullness in the head—we have decided to discontinue its use. The fact that more reactions to this large dosage of iodide do not occur is explained by the very rapid dilution and peripheral distribution of the drug.

The vascular pattern of the renal parenchyma in the normal kidney is typical (Fig. 1). The chief value to the urologist of this method of examination is in demonstration of the vascular pattern of the kidney in a great variety of conditions ranging from congenital anomalies and hypertension to retro-peritoneal tumours. It is also useful as a supplementary test of kidney function and in cases where it cannot be evaluated in any other way (Fig. 2).

It is useful in the differentiation of renal tumour and cyst. It is especially useful in the demonstration of aneurysms and abnormalities of the aorta and some of the branches, *e.g.*, the iliac and femoral vessels and to determine the position of the placenta.

It is true that some of the evidence which can be obtained by this method of examination, *e.g.*, kidney function, can usually be obtained

by simpler methods. It is true that the differentiation between a renal tumour or cyst is not always very important and the same is true of the abnormalities of the great vessels. However, it is a relatively simple method of examination which yields information of great interest, often of much importance. We have only done 52 cases but it is a procedure that we now feel we can safely offer to any patient and we think it has been well worth the effort expended to develop a reasonable degree of proficiency.

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### THE ARTERIOSCLEROTIC PATIENT AS A SURGICAL RISK\*

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SURGERY TODAY has reached a remarkable level of efficiency. With modern surgical techniques employed by men especially trained in their use and with the effects of blood loss reduced by transfusion and the antibiotics as a potent weapon against infection, it is now possible to perform successfully operative procedures upon any of the body organs. Indeed, so dependable has surgery become that the medical profession and the laity alike expect as a matter of course that cases upon whom even very difficult operations are performed will do well.

For surgery to become entirely safe requires the elimination of a group of operative and post-operative complications containing such entities as cardiac standstill, postoperative hemiplegia, phlebo-thrombosis with pulmonary embolus, coronary thrombosis, cardiac failure, postoperative pneumonia, postoperative acceleration of senile degeneration, renal failure and the group of cases in which coma, convulsions and other manifestations of electrolytic disturbance occur. Attempts have already been made towards re-

duction of the number and severity of these sequelæ: postoperative pneumonia is no longer feared; we have learned much about venous thrombosis and pulmonary emboli and, although we still do not seem to have eliminated these risks, we are at least much more knowledgeable of them than we were; some of the causes of cardiac standstill can now be guessed at; and we are rapidly learning more about the electrolytes.

I should like to refer to a special group within these postoperative complications. This group, linked together by common etiology may be referred to as "arterial accidents" and I need only speak of postoperative hemiplegia and coronary thrombosis for the implications of the term to be plain. With an understanding of the mechanism causing these two, the inclusion of such conditions as accelerated senile change, renal failure and possibly cardiac standstill in the group will become obvious.

Operative and postoperative arterial complications at sites distant from the operative region have not received the attention they deserve. Operative risk assessment insofar as the vascular tree is concerned has usually dealt with the risk of venous complications or, should arterial disease be present, with the significance of the hypertension so often its accompaniment. This last has been a most fortunate preoccupation, for the risk does not centre on the hypertension

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but upon the condition of the arteries which sustain it. It is not the high blood pressure but the degenerated, thickened vessels which matter and, indeed, the hypertension in these cases is often a desirable rather than an undesirable feature, for it is only when the pressure falls below the level capable of sustaining an adequate flow past the obstructions of diseased arteries that trouble arises.

While discussing the risk of operation in arteriosclerotic cases it is important to say a few words concerning the advance assessment of such risks. There are four principal arterial beds in which interruption of flow is to be regarded as most dangerous and in which the likelihood of even minor arrests should be calculated prior to embarking upon major surgery. These are the cerebral, the retinal, the coronary and the renal circulations. The mesenteric vessels are omitted because of the apparently infrequent occurrence of their postoperative accidents and, because of the difficulty of quantitative estimation of their function. The assessment of the operative risk in arteriosclerotics is based upon the assessment of the other four, taken both individually and in their relation to the patient as a whole.

In assessing the state of the cerebral vessels one is guided by the patient's mental condition and in particular by recent changes, paying especial attention to features suggesting senility. It is at this point that personal contact with the patient is of such great value. To the physician alert to such matters the senile mind can often be suspected after a few minutes' chat when the rigid ideas, the preoccupation with the past, the difficulty in accepting change are often there for the asking and can be used as suggestive evidence, especially if reinforced by the general appearance of the patient. Senility sometimes signals its early changes by the appearance of emotional lability. Should vascular accidents have occurred in the past careful note must be taken of them.

Familiarity with use of the ophthalmoscope is necessary in judging the condition of the retinal vessels. From our experience local failure of the retinal circulation following major operations elsewhere must be quite infrequent but, the retina being the only spot in the body affording a direct and unimpeded inspection of a portion of the arterial tree, its examination presents definite advantages. At the same time, one may look for cataracts as further evidence of senile change.

In considering the state of the coronary arteries a careful history of angina and breathlessness will be most helpful; should the degree of dyspnoea suggest actual congestive failure, one must take this finding as of grave omen; angina, while it demands caution, is not of as prohibitory significance. Enlargement of the heart and hypertension, of which something has already been said, are to be noted. The renal circulation requires for its detailed evaluation an account of the blood values for substances cleared by the kidneys, but a fairly good estimate of it can be obtained by taking serial specific gravity values on early morning specimens passed after a period of fluid restriction. The kidneys' ability to concentrate at or above the mid-twenties under these conditions indicates a good reserve power which speaks for a reasonably good blood flow. Another valuable indication of renal function, especially for cases in which advanced inadequacy is suspected, is the presence of nocturia provided, of course, that the question of bedtime or evening fluids is ruled out in the history.

In estimating the state of the blood flow through these various vascular beds of the body one should not forget the general appearance of the patient. The old face, the loss of briskness of step and voice, the laxity of the skin, the shrinking of the stature, these things come when Nature closes in the fringes of its vascular tree; and it can be argued that ageing in the patient means ageing in his blood vessels.

Having come to some decision about the patency and general state of the arteries it remains to estimate the strain the patient is to undergo during his operation and the capacity of his circulation to survive it. The cardiovascular system during major surgical procedures is exposed to several hazards, most notable among which are anoxæmia, tachycardia, exertion, hypotension and the toxic effects of the drugs and anæsthetic used. Of these five only two are new experiences, hypotension and the drugs, the others have been part of the patient's everyday life and their effects during operation can be anticipated. I shall leave it to the speaker following me (see p. 267) to discuss the drugs to be used; it is of the effects of hypotension that I would like principally to speak.

Each of the four organs whose arterial beds I referred to above is very susceptible to reductions in its blood supply, particularly in regard

to oxygen. The ability of these various tissues to withstand ischaemia depends upon such factors as the state of nutrition of the tissue at the time and upon the possible summative effect upon it of drugs to which it may be concurrently exposed. On the other hand, the process of reduction of local blood supply depends upon the calibre of the local blood vessel and upon the pressure under which it works, with such factors as dehydration and the increased viscosity of the blood playing a part. Ulceration of the endothelium over atheromatous plaques sometimes occurs and may be important, as local blood clotting may lead to complete arrest of the blood flow and necrosis of tissues beyond. Short of complete closure, lesser interference with the flow or temporary complete cessation may affect the metabolism of the dependent region, but if the flow is resumed early enough the changes brought about may reverse themselves, although it should be borne in mind that there is a time limit beyond which this will not occur. In summary, it may be said that interference with local blood supply during operation at sites apart from the operative field is usually the result of two factors, sclerosed and narrowed arteries and a fall in blood pressure. The duration of the reduced flow plays an important part, as may the occurrence of blood clotting.

The cause of hypotension occurring during major surgical procedures has been the subject of a great deal of work and there are many ideas concerning the mechanisms responsible; for the purpose of this presentation we shall accept it as due to blood loss, visceral trauma and the effects of drugs upon vasomotor control. Insofar as the first of these is concerned, it is the usual practice to have a supply of blood on hand to take care of the blood loss at operation, its administration being left to the anaesthetist who, by virtue of his observation of the blood pressure changes is in the proper position to do so. An alert anaesthetist who understands the operative procedure being carried out can anticipate such blood losses and visceral manipulations as are likely to occur and prepare for them. If the preoperative and the postoperative medications are made his responsibility, as they may be, he can govern the anaesthesia accordingly; if, as well, he has been alerted to the arterial risks in the case he can do much to lessen not only the hypotension and the drug risks but the danger to the patient through undue anoxaemia and the other hazards referred to above.

Accepting that the arterial risks dealt with are of the importance claimed and that the basic danger in operating upon these people lies in allowing their blood pressure to fall below the critical level imposed by the state of their blood vessels, it follows that much of the proper management of these cases depends upon deciding where this minimal safety level lies. The hypertensive and the patient with normal blood pressure alike, if arteriosclerotic, will suffer if pressure falls occur which are excessive for them. How are we to decide where the danger level for each lies? There are several ways of doing so but it seems to me that the one which is simplest and most free of unnatural variables consists in following the blood pressure's diurnal variations, making a twelve- or twenty-four-hour curve of readings taken each hour, awake or asleep, and using as the safe level the lowest readings obtained. It follows that if the patient is still well following the period of observation, the lowest levels registered must have been compatible with proper circulation to all his parts.

It may take an extra day or two in hospital to obtain this information but I believe it is well worth the trouble and additional expense to the patient. If the pressure is kept at or near this level during the operative period and for twenty-four or more hours after and if any dips below it are promptly corrected, using vasoconstrictors such as adrenaline or ephedrine, it is my opinion that many of the arterial accidents which at present mar the results of good surgery will be prevented. Indeed, some of the present unfortunate complications should quite disappear and some patients now excluded from necessary elective operations because of hypertension or old age may be treated safely.

There has been considerable interest lately in the possibility of carrying out major surgical procedures upon patients rendered intentionally hypotensive, benefiting thereby from the lessened bleeding which follows. Using such methods as exsanguination, total spinal blocks and methonium medication satisfactory results are reported, but the management of the patient to ensure a proper blood flow to the essential organs whilst in the hypotensive state is an exacting business. It is certainly not to be undertaken by any but the most experienced, and until a great deal more is known of its basic dynamics its dangers will prevent its becoming a very popular procedure.

PSYCHOLOGICAL ASPECTS OF  
PHYSICAL ILLNESSE. WITTKOWER, M.D.,\* *Montreal*

MAYO (1945), in his book, *The Social Problems of an Industrial Civilization*, points out that in the training of students emphasis is placed disproportionately on the development of technical skill, whereas training in social skill has been badly neglected. As a result of this defect in our teaching, the medical student leaves the medical school well informed about morbid anatomy, diagnostic procedures and materia medica, but ill informed about the psychological and social problems of his patients and about the elementary principles of patient management. He is expected to "pick them up as he goes along". Why does a patient delay seeking medical help when it should be obvious that he needs it? How does he react emotionally to the intimation of the diagnosis? What does it mean, psychologically, to be ill? What is the attitude of the patient's environment and of the community at large towards his illness? Which psychological factors deserve special consideration in the management of the patient? What determines a satisfactory doctor patient relationship? And what are the psychosocial position, the rôle and the function of a doctor? These are some of the questions which will be discussed in this article.

## I. INITIAL STAGES

*Delay in patient-doctor contact.*—If a person feels very ill, if he is in acute pain, or if there is indisputable evidence of illness such as a high temperature, a surface tumour, a purulent discharge, or if bodily functions are grossly and unmistakably disturbed, he will usually consult a doctor at an early date. But if the illness starts with general malaise, or with vague symptoms, he is apt to evade the issue and to attribute his discomfort to some trivial cause. He may argue that lately he has been overdoing it a bit and that all will be well after a good holiday. In this way he may considerably delay the diagnosis and act against his own interests. The reason for this regrettable behaviour lies not only in an understandable optimism but also in a conscious or unconscious denial of the seriousness of the condition. After all, admission of illness may imply a threat to life and existence,

possible exposure to risky and painful operations at the worst; and loss of wages, expense and temporary interference with the pleasures and enjoyment of life in general at the best. Other reasons for delay in patient-doctor contact may be cheerful or pigheaded refusal to admit illness, ignorance, stupidity or mental deterioration due to old age. Delay in patient-doctor contact is more common in disorders which, according to popular belief, offer a doubtful prognosis such as malignant growth or tuberculosis, than in others such as venereal disease which are known to respond well to early treatment.

*Suppression of symptoms.*—Especially when the prospect of painful surgical procedures has been envisaged suppression of symptoms may operate to such an extent that the actual symptoms, e.g., toothache, have disappeared by the time the patient plucks up enough courage to consult a doctor. It is as if the dental patient wants to say: "I have no toothache any more. Why should I undergo this painful procedure?"

*Intimation of diagnosis.*—The doctor may succeed in dispelling unwarranted fears, or he may intensify them by his verdict or by the manner in which he pronounces it. I know of a doctor who peremptorily told a patient that she had two large cavities in the right lung and a smaller one in the left. Conversely, while it is true that, as patients, we hope to be reassured by our doctors, reassurance for reassurance's sake does more harm than good. Such practice only shatters the patient's trust in their doctors and leads to disillusionment, if not violent resentment when the truth comes out, as assuredly it will.

*Reaction to diagnosis.*—Generally speaking, varying from individual to individual and with the diagnosis, patients receive the diagnosis with a sense of relief, or they are shocked, dazed, incredulous or little concerned. A sense of relief is often felt even when the diagnosis is by no means reassuring. Now at last and at least the patient knows what is the matter with him and something can be done about it. Incredulity differs from a state of being dazed (or fainting) only insofar as the former is a conscious, and the latter is an unconscious, denial of the unpalatable truth. Incredulous patients may either completely disregard the diagnosis or they may start on a pilgrimage from doctor to doctor until they hear what they wish to hear.

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*Admission to hospital.*—New fears arise in many patients' minds when admission to hospital is suggested. These fears may be justified to some extent because, by and large, such suggestion signifies that a serious view has been taken of the patient's case and that surgical intervention may have been contemplated; but also, rather illogically, admission to hospital means to many patients exchange of the accustomed security of their own homes for the unknown, unaccustomed, and therefore potentially disquieting and even dangerous, hospital atmosphere. Fear of hospitals and fear of doctors is widespread. They could be lessened and deprived of their rational content if, in patient management, more thought could be given, and attention paid to, the patients' state of mind. As in the much debated political sphere, one sometimes wonders whether medical institutions have been designed for the institution's sake (the State), for the convenience and the interests of the medical and nursing staff (the rulers), or for the interests of the patients (the people).

Admission to an institution which caters for patients suffering from the same complaint has its advantages and disadvantages. On the one hand, as far as the patient is concerned, it does away with the feeling that he is one of the few unlucky ones; on the other, it brings him face to face with the worst features of his complaint, with complications, with setbacks and failures of treatment. Patients are inclined to compare notes and, according to their temperament, they may either derive comfort from those who recovered or be thrown into despair by those who did badly. Generally speaking, it is true that hearty, outgoing individuals revel in the community life of the ward, whereas shy, retiring, shut-in individuals suffer acutely under the same circumstances. One may well wonder whether, and how often, the beneficial effect of institutional care is cancelled by the misery of these patients and whether selection of patients for institutional care, if based not only on physical grounds but also on an assessment of the personalities concerned, would not pay a high dividend.

## II. ILLNESS

1. *Illness increases a person's self-love.*—In his classical paper on disease- and patho-neurosis, Ferenczi points out that illness, of necessity, leads to a withdrawal of object-libido and to a concentration of all egotistic as well as libidinal interests in the ego. If my house is on fire my

immediate concern does not go much further than my neighbour's property; and if I am ill, my ill-health is my main concern. Hence almost invariably chronically sick persons, especially after periods of prolonged hospitalization, become self-centred. The degree of this disease narcissism depends on three main factors: (1) the amount of constitutional narcissism, (2) the real or imagined seriousness of the illness, and (3) the nature of the illness. Ferenczi has rightly pointed out that disfiguring diseases, diseases of and injuries to the eyes, and diseases of the genitalia more than others evoke a regression to disease-narcissism.

Withdrawal of libido does not only affect the individual but is also noticeable as a group phenomenon. Anybody who has spent any length of time in the sanatorium world must have noted how, as time goes on, the horizon of the tuberculous community gradually shrinks and how, as events outside fade away, small events inside the small sanatorium world assume disproportionate significance.

2. *Illness may lead to hypochondriacal tendencies and to hysterical manifestations.*—So long as we feel fit we take our health for granted and regard our bodies as anonymous. Well-adjusted individuals are never particularly concerned about the possibility of illness, mutilation or death. But as soon as we are ill—and especially if we are seriously ill, and if the illness is protracted—our sense of inviolability is shattered and, magnet-like, our attention is drawn to the affected part of the body. Or in analytical terms, libido withdrawn from without is invested on the disease-affected or injured part of the body.

As a result of this local increase of libido symptoms may come into evidence which are not directly related to the structural lesion, *e.g.*, vague shifting chest pains in persons who know that they suffer from tuberculosis, or eyestrain, blurring of sight, photophobia, and nightblindness in persons who have lost vision in one eye, or pruritus vulvæ in connection with prolonged gynaecological disorders; or symptoms may persist after the actual disease has ceased to exist, as in the case of coughing following whooping cough, diarrhoea after gastrointestinal infections and localized pain after operations.

3. *Illness imposes dependency.*—As healthy adults we are expected to discharge our duties and to take full responsibility for our actions. But if we are very ill, these responsibilities are taken

off our shoulders and other persons look after us. If we are very ill we may be forced to renounce our adult rights and may have to be attended to as if we were babies. Such attendance may be a necessity or it may be imposed especially by the nursing staff without sufficient justification. Many nurses, for instance, show a preference for nursery terms. "Be a good girl", a nurse may say to a lady of over 80, and patients of either sex are invariably told off as being "naughty" if they have not carried out instructions. During the war I was a patient in an officer's ward. One day a pretty nurse came in and whispered into my ear "Yes?" or "No?". At first I thought she wanted to make a date with me until I realized that she wanted to know whether I had emptied my bowels.

To return to the problem of disease dependency, it appears that some patients protest and rebel against it in an unreasonable manner, while others surrender to it almost voluptuously with very little intention of giving it up.

4. *Illness interferes with a realistic outlook on life.*—Nothing in this world is perfect, and omniscience and omnipotence are no human attributes. Hence, if a person scribbles on a wall that the Duce is always right, or if he believes that a doctor can repair what is beyond repair, he reveals by doing so that he has slipped back into childhood behaviour or that perhaps he has never properly grown up. Trust in, and reliance on, the doctor are desirable but childlike blind faith in his infallibility, just as suggestibility, are regressive phenomena. Both these phenomena are based on dependency, anxious self-concern and hope for recovery sometimes obviously against hope.

Every doctor knows—but how often he forgets—to what extent patients, if they are seriously ill, hang on his lips. Every professional remark—what he says and how he says it—and even unintentional silence on his part is turned over in his patients' minds and interpreted, often quite absurdly, as of hopeful or of ominous significance.

5. *Illness may lead to loquacity and phantasy formation.*—Loquacity is particularly marked in bedridden individuals in whom imposed muscular inactivity not infrequently leads to emotional tension. Deprived of the ability "to work it off" by action these individuals seek and find a vicarious outlet in speech which, according to Sherrington, must be regarded as standing be-

tween musculo-skeletal behaviour (*i.e.*, action) and thought. Alternatively, blocking of muscular activity may lead to concentration on thought and phantasy. Is it not understandable, as I saw it in the tuberculous, that a person tied down to a bed with the future still very much in the balance tries to find some substitute gratification in the pleasant thought of spending a glorious holiday in the South of France or, in the case of some women, of rearing half a dozen bonny children.

6. *Illness makes for need of affection.*—If a person is ill he naturally feels sorry for himself, and is in need of affection. He usually gets a good deal of it, perhaps even too much. This need of affection may be related to loss in various spheres, an inevitable result of illness, to frustration, helplessness or a real or imagined threat to life. But it may also arise from feelings of guilt. By and large, there is no justification for feeling guilty over being ill. A person who feels guilty over being ill—or more specifically over letting down his family by reason of his illness—reveals by doing so that he is vaguely aware of a concealed aggressive aim and purpose in his illness which he cannot tolerate. For instance, a person whose illness is motivated by conflicts over ambivalence, or whose conflicts over ambivalence have been intensified by his illness, is likely to be in greater need of affection than others because he is afraid of being found out and because he wants to be reassured that this has not happened yet.

7. *Illness mobilizes aggressiveness.*—Chronic illness almost invariably mobilizes aggressiveness which may find expression in irritability, temper tantrums, touchiness, or in bitterness and frank envy of those who are more fortunate. Irritability has often been attributed to toxæmia whereas in fact toxæmia only engenders a removal or lessening of otherwise operative inhibitions. Touchiness, complex in origin, may be based on the trauma to the patient's narcissism, his sense of inferiority, his guilt over being ill and his excessive need for affection. A person in great need of affection suspects slights where none exist. Temper tantrums and obstreperousness in adult patients, in keeping with other features, often have a childish quality. Displacement of resentment may become systematized and may then be directed against the Government, "the system", the medical institution, doctors, nurses, or any item of alleged mis-

management. There may be a good deal of truth in some of these accusations but the possibility of projective mechanisms and of displacement should be borne in mind.

8. *Illness may evoke feelings of shame.*—For many persons illness is equivalent to weakness or failure and the very fact that it could happen to them is sufficient to be felt as a narcissistic trauma. "I have always made a fetish of my health", a patient may say, "to think that I am unfit hurts my pride". For this reason and for others patients not infrequently feel ashamed of being ill. Shame is, of course, intense if a patient, as in rosacea, unconsciously regards his complaint as visible evidence of a well-deserved punishment, and it is intensified if the disease is of such a nature as to evoke disgust or fear in the community, *e.g.*, eczematoid dermatitis on the face or pulmonary tuberculosis. In addition, as the patient realizes that there is something bad in himself—the illness—he may unconsciously jump to the conclusion that *he* must be bad and repulsive to others even if he is not. Disproportionate emotional reactions of patients to minor acts of kindness, which we find quite commonly in the chronically sick, can only be understood on the basis of the assumption that they do not believe that they deserve them.

9. *Illness affects a person's mood.*—A patient's mood varies to a certain extent with the nature, severity, course and duration of illness. It obviously fluctuates with the ups and downs of his illness and with success or failure in treatment. It ranges from little concern or fatalistic acceptance at one end of the scale to severe depression and anxiety at the other. Depression and anxiety due to illness and its implications in the occupational, economic and domestic spheres are normal and adequate emotional reactions so long as they are in keeping with the patient's objective condition; but not infrequently objective condition and emotional reaction grossly contrast. Defences against depression and anxiety are defiance, ultracheerfulness, displaced resentment and apathy; a pose of little concern or of resignation may also conceal depressive and anxious features.

### III. CONVALESCENCE

Many doctors consider the speed of convalescence as a function of the receding illness. But this is not always the case. Well known is the patient who tries to run before he can walk, and

the other in whom convalescence is delayed unrelated to, and irrespective of, disappearance of signs of illness. Psychologically, convalescence has been compared with adolescence. As the patient emerges from the regressive state of illness he may resume his previous state of adult maturity without delay, or his puberty, as it were, may be stormy or unduly prolonged. Some patients are obviously reluctant to give up the protection and other benefits which they received while they were ill whereas others, similar to puberty rebellion, act foolishly against their doctor's advice and, incidentally, against their own interests. In keeping with the simile, one would expect, and actually finds, that overprotection fosters delay of recovery while severity and unnecessary restrictions make for rebellion and foolhardy behaviour.

To deal effectively with this situation is obviously part of true rehabilitation which, as viewed from this angle, aims not only at restoration of function of the damaged part but also—and chiefly—at preparation of the patient for the rôle which he has to play afterwards. Any measures which serve the patient's re-adaptation to the demands of a healthy world are likely to facilitate the transition from sickness to health. It appears doubtful whether some of the traditional procedures of rehabilitation, *e.g.*, occupational therapy in its present form, fulfils this function.

### IV. THE PATIENT AND HIS ENVIRONMENT

A patient may not only be irritable but he may also be irritating. We all know the patient who groans and moans apparently without sufficient justification, and who worries—and annoys—his environment by constant demands for attention. The reason for his moaning may be pain and its purpose to obtain relief. But is this really the whole story? The word "complaint", not only in its colloquial but also in its medical usage, signifies or implies an accusation. This accusation may be levelled against the patient's attendants for not doing enough for him or for not sympathizing enough, against fate, against some individuals whom he holds responsible for his suffering, or perhaps against society in general. Patients usually realize that they resent their illness but they often fail to recognize how resentful they are of their need to accept dependence and of seeing their healthy attendants bustling around. Many patients are intolerant towards,

and make excessive demands on, their environment. Their lack of consideration arises from their egocentricity; if a person's self-interest is inflated one cannot expect him to be considerate.

The counterpart of the complaining patient is the uncomplaining patient. Unusual meekness in patients may arise from various sources: (1) a patient may genuinely enjoy the advantages of illness (refuge in illness); (2) guilt over being ill, helplessness and need for affection may have forced him to suppress his aggressiveness; or (3) experiences in the past may have taught him that apparent docility and submissiveness are more effective means of achieving his ends and of dominating his environment than a demanding attitude.

However, even if well concealed, the patient's environment senses the aggressive function of illness or aggressiveness mobilized by illness; or it may react to illness as if it were an act of spite. Unfortunate, for instance, are the marriages broken up because husband or wife could not or would not tolerate being married to an invalid. But, more commonly, illness calls forth feelings of kindness in healthy persons. Everyday experience shows that a person's value goes up if there is a likelihood or risk of his departure. Hence, whether they had been truly attached or harboured hostile feelings, most persons experience serious concern in a case of illness, though for different reasons, and show by word and by deed how much concerned they are. If they do, they feed by doing so the patient's egocentricity.

#### V. PATIENT-DOCTOR RELATIONSHIP

A patient goes to a doctor because he wants help and because he is anxious to get well. Because of his anxious concern regarding himself, and perhaps because of doubts in his doctor's ability to help him, he magnifies the doctor's powers, as has been pointed out. "I am clay in your hands; you can break me or make me", a patient said. If one's phantasy enlarges a person to over life size and endows him with giant's strength it makes one feel small, helpless and fearful. But fears concerning the doctor are justified to a certain extent even in reality. He gives instructions, imposes restrictions, prescribes nasty medicines, suggests operations, reprimands and may even expel a patient from a medical institution if he pleases to do so. Hence the relationship of patients to their doctors is a

delicately poised affair. It is positive so long as the patient expects good from the doctor, and negative if the desired results are not forthcoming or if, justifiably or unjustifiably, he feels shaken in his confidence.

How do doctors respond to this situation? They either realize the motives behind their patients' phantasy and deal with it accordingly, or unrecognized by themselves, they accept the phantasy as truth and use it to feed their self-adulation. "If my patients believe that I am so clever", they seem to argue, "there must be some justification in this assumption". How very few of our colleagues can tolerate lack of success with or hostility on the part of their patients; this is no doubt one of the reasons why neurotic patients are so unpopular in general practice.

We all know the pompous type of doctor—a man of ostensible wisdom and erudition, impeccably dressed, a model of dignity and of his profession, who impresses the patients by his very appearance and by his consulting room, and who comes nearest of all to the patients' godlike concept of a doctor; the suave doctor who by his suave bedside manners, thinly disguises his superciliousness; the good old uncle, roundfaced, rubicund, always ready for a joke out of his seemingly inexhaustible stock, who pinches his female patients in the cheek, or pats his male patients on the back and leaves them in no doubt that he knows it all, whereas they, irrespective of age, are only silly little boys and girls who know nothing; the blunt and brusque doctor who, behind his harsh façade, often conceals a heart of gold and whose very rudeness is impressive. And there is the technician who places his intelligence and knowledge at his patients' disposal with no pretences, or, let us say, with very few pretences.

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The key to every man is his thought. Sturdy and defying though he look, he has a helm which he obeys.—Emerson.

## CORTISONE AND ACTH IN THE TREATMENT OF RHEUMATIC FEVER\*

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FOLLOWING upon Hench's original communication<sup>1</sup> dealing with the treatment of acute rheumatic fever with cortisone, a number of reports<sup>2 to 11</sup> have been published describing the course of this disease under treatment with cortisone and ACTH. The total number of cases studied is still small and the need for careful evaluation of therapy in a much larger number of patients is stressed by all authors.

It is well recognized that the final evaluation of these hormonal agents in the therapy of rheumatic fever will require several years' follow-up to decide whether or not heart disease has been prevented. For the present an attitude of caution must be observed, with due regard to the variable course shown in the natural history of this illness. Rather dramatic results have been obtained in the first few days of therapy by all those employing cortisone and ACTH in the treatment of acute rheumatic carditis. On the other hand, there is considerable variation in the experience of different authors regarding the degree of cardiac involvement remaining after treatment. The assessment of any agent in this regard is further complicated by the well recognized instances of acute rheumatic pancarditis which recover spontaneously without residual heart disease. Thus the final evaluation will depend upon how frequently the cortisone treated carditis patient escapes without permanent cardiac involvement. In the meantime the general clinical improvement is sufficiently striking in this group of cases to make it reasonable to think that all patients with clinical evidence of acute carditis should receive one of these agents.

Assessment of therapy in patients with little or no clinical evidence of cardiac involvement is even more difficult and will require some years of follow-up to observe how frequently

heart disease manifests itself. The striking feature in the treatment of these patients is their healthy appearance in contrast with the picture of pallor, listlessness and fatigue one is accustomed to see for a number of weeks among patients not treated by these agents. Whether this improved clinical state is of importance eventually is as yet unknown. In this group experience to date suggests that this therapy may reduce the incidence of patients who formerly had long periods of hospitalization because of low-grade rheumatic activity.

There is considerable discussion regarding the mechanism of these drugs in this disease, as to whether they act by suppressing the clinical manifestations of the disease until it runs its natural course, or whether they arrest and cure the rheumatic state. Clinical experience of our own and others may be brought in support of either contention. Clinical manifestations may be suppressed, only to return with discontinuance of the drugs. On the other hand, some instances of acute carditis which may almost certainly be expected to run a prolonged course, show no clinical manifestations of activity after quite short periods of therapy.

It is the general impression that the most favourable results are likely to be obtained in the first acute attack treated early and adequately. It is also important to know if patients who have had previous episodes of rheumatic fever respond in the same manner as do those in initial attacks. Nine patients had had one or two prior episodes and response to therapy appeared to be as satisfactory as in those treated in the first attack.

The present report is concerned with the assessment of therapy in 39 children with rheumatic fever treated after March, 1950. These children are the first of 62 patients treated to date (September, 1951). The follow-up period is between three and sixteen months. With a few exceptions, patients with active rheumatic fever who entered the hospital during this period were treated with either intramuscular or oral cortisone, or with ACTH. The criteria for diagnosis were those laid down by Jones.<sup>12</sup> Nineteen girls and 20 boys between the ages of 3½ and 15 years, comprise the group now being reported. From the data presented below it will be evident that these patients represent an average group of cases of active rheumatic fever, and include patients with serious cardiac involvement as well

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as those with little or no clinical evidence of heart disease. There were also 5 patients with chorea.

#### THERAPY

The majority of our patients were treated with intramuscular cortisone. If a child's condition was acute or heart failure was present, ACTH or oral cortisone was employed. It was thought that the more rapid action of these preparations might be of importance in a seriously ill patient; also their shorter duration of action might be desirable in instances of heart failure if withdrawal of therapy was required due to the salt-retaining properties of these drugs. Experience has shown that a low sodium diet and mercurial diuretics adequately remove this hazard. The diet employed in these studies contained 0.8 grams of sodium. However, in view of the bulimia manifested by many children while on therapy, the sodium ingested exceeded this amount in many cases. It is of interest that there was no significant increase in weight of patients on this diet during therapy.

(a) *Intramuscular cortisone*.—Twenty-six patients received daily single injections of intramuscular cortisone. Fourteen were treated for 20 to 23 days with a total amount which averaged 2.285 gm., the daily dose starting at 200 mgm. for 2 days and continuing thereafter at 100 mgm. daily. A trial of this 3 week period appeared reasonable after our earlier experience of treating 12 patients with periods varying between 1 and 5 weeks.

(b) *Oral cortisone*.—The 7 patients treated with oral cortisone received the drug every 8 hours for a period between 20 and 28 days, the total dosage averaging 3.204 gm. The initial daily dose was usually 200 mgm. (range 150 to 350 mgm.) for 1 to 4 days, with subsequent doses of 100 to 150 mgm.

(c) *ACTH*.—Six children were treated with ACTH intramuscularly every 6 hours. There was considerable variation in dose and duration of therapy. Total amounts administered ranged between 480 mgm. and 2.54 gm. for periods varying between 7 and 39 days.

#### EFFECTS OF THERAPY

An analysis of the various clinical manifestations and laboratory data in the 39 patients is presented below. It will be noted that this information is complicated by the fact that treat-

ment was carried out with one of three preparations. Inasmuch as some manifestations were more quickly affected by oral cortisone and by ACTH than by intramuscular cortisone, these variations are noted.

*Fever*.—The temperature was normal in 13 cases prior to therapy. Where it was elevated, it returned to normal at a little more rapid rate when oral cortisone and ACTH were used. With intramuscular cortisone normal temperature was reached in an average of 50 hours (range 24 to 168 hr.): with oral cortisone it required an average of 16 hours (range 12 to 24 hr.): and with ACTH the average was 32 hours (range 12 to 72 hr.).

*Pulse rate*.—The sleeping pulse rate reached its lowest point in 3 to 10 days in most cases.

*Arthritis*.—Arthritis was initially present in 29 of the 39 patients, but in only 17 were pain and swelling still present by the time therapy was started. With intramuscular cortisone the time required for complete relief of joint manifestations averaged 65 hours (range 24 to 96 hr.): with oral cortisone the average was 18 hours: and with ACTH the average was 42 hours (range 24 to 96 hr.).

*Nodules*.—Two patients had subcutaneous nodules. One was treated with ACTH for 38 days. There was a gradual reduction in size of nodules with their subsequent disappearance in 7 weeks from start of therapy. In this case biopsy specimens were obtained prior to cortisone administration and on the 20th day of treatment. There was no significant difference in the histological appearance of these specimens, both of which showed findings typical of subcutaneous rheumatic nodules.\* In the second patient, the nodules disappeared in 6 weeks and their rate of disappearance apparently was not influenced by therapy.

*Cardiac involvement*.—*Acute carditis*.—Seven of the children in this series were seriously ill with the manifestations of acute carditis. Two of these had had rheumatic heart disease of some years' standing but the remaining five did not have known heart disease prior to the treated attack of rheumatic fever. There were no deaths. Although there has been a varied experience regarding the residual heart damage in this type of case, there is general agreement in the observations on the marked change in clinical state which this type of patient undergoes within

\*We are indebted to Dr. F. W. Wigglesworth for the pathological report of these biopsies.

the first 2 or 3 days of therapy. This improvement, which is rather dramatic, is noted by the reduction of "toxicity", temperature, pulse, respiration, dyspnoea and gallop rhythm. Of the 5 patients without prior heart damage, 3 have remained without clinical evidence of cardiac disease. In 2 of these children, there was a marked reduction in heart size within 3 and 6 days respectively, whereas the third child showed a gradual but steady reduction in heart size during and after therapy. The 7 patients seriously ill with acute carditis are briefly summarized below:

#### CASE 1

Female, age 14 years, with established rheumatic heart disease, was treated at the time of subsiding pericarditis, and had a satisfactory response in the temperature and pulse rate within 48 hours. She was treated for 10 days with intramuscular cortisone and on the last day of therapy had an episode of pulmonary oedema quickly relieved by the usual measures. The 4th day following cessation of therapy, temperature and pulse rate rose, chest pain and friction rub returned, and fluoroscopy revealed only the slightest pulsations of heart borders. A second course of cortisone intramuscularly was started. An improved clinical state and return to normal of temperature and pulse, with increase in amplitude of cardiac pulsations under fluoroscopy occurred within 48 hours. The friction rub disappeared in 168 hours. This second course of therapy was continued for 13 days. Sedimentation rate fell during therapy but rose after it stopped and remained elevated for some weeks. The pulse rate which returned to normal in 48 hours, rose in the latter part of therapy and returned to normal levels 2 weeks after treatment was stopped. A point of particular interest in this case was the marked clinical improvement in this very ill child within the first 48 hours of treatment of the second course of therapy.

#### CASE 2

Female, age 10 years, with no known rheumatic fever or heart disease prior to treated attack. She was the first observed in an extremely ill state with an illness of 5 weeks' duration, and showed evidence of acute carditis with fever to 103°, tachycardia, friction rub, and absent movement of cardiac borders under fluoroscopy. Her clinical state was greatly improved with 2 days of intramuscular cortisone, but pulse and temperature required 4 days to return to normal and the friction rub lasted the same period of time. She developed signs of fluid retention and therapy was stopped for a few days. A satisfactory diuresis was obtained by mercurial diuretics and cortisone was started again and continued for 10 days. Through this period there was a gradual reduction in heart size and 10 days after therapy was stopped a marked decrease in the intensity of an apical systolic murmur was noted. Seventeen weeks after commencement of therapy the patient was discharged from hospital with a heart of normal size and a very slight apical systolic murmur. At follow-up 1 year later, she was without clinical evidence of cardiac involvement. In this case there was no doubt about the strikingly beneficial effect of the cortisone within the first few days. How much subsequent therapy influenced the course of the disease is much more difficult to evaluate.

#### CASE 3

Male, age 4½ years, ill for 1 month in his initial attack of rheumatic fever and complaining of dyspnoea and orthopnoea for 3 days prior to admission. He was

extremely ill with fever, tachycardia, tachypnoea, and evidence of heart failure. With 48 hours of ACTH there was a marked improvement in his general clinical state, with temperature and pulse at normal levels within 72 hours, during which time the gallop rhythm disappeared. There was no change in an apical systolic murmur of moderate intensity during or after therapy, but there was a significant decrease in heart size by the 6th day of therapy. Four months after therapy, the child's condition was satisfactory and the murmur was unchanged.

#### CASE 4

Female, age 5 years, with a second episode of rheumatic fever, had been ill for approximately 3 weeks prior to therapy. She had a fever to 101°, tachycardia, moderate general cardiac enlargement, grade 2 blowing systolic murmur at apex with early slight apical diastolic component. After 6 days of cortisone intramuscularly, a change was noted in the auscultatory findings, the sounds no longer being hectic and the apical diastolic not being heard. Four days following completion of the first 21-day course all signs reappeared and it required a larger dose to control them. At follow-up 2 months following therapy there was a slight apical systolic murmur and the heart was approximately the same size as on admission.

#### CASE 5

Male, age 8 years. This child in his first episode of rheumatic fever was acutely ill with fever, tachycardia, gallop rhythm, friction rub and a heart which, though only at the upper limit of normal in size, did not show any pulsations on fluoroscopic examination. Response to ACTH therapy was rapid. The only evidence of possible residual cardiac involvement was the persistence of moderate tachycardia, because of which he was maintained at bed rest for 2 months following treatment. Thirteen days after leaving hospital on a regimen of restricted activity, he became seriously ill with evidence of acute carditis, congestive failure and marked cardiac enlargement with absent pulsations of the cardiac borders. His response to treatment was again satisfactory and the heart size returned to normal within 6 days and there were no abnormal auscultatory findings.

#### CASE 6

Male, 11 years. This boy had had two prior episodes of rheumatic fever. The present episode was characterized by fever to 104°, tachycardia, chest pain, pericardial friction rub and moderate cardiac decompensation. On fluoroscopic examination the heart was seen to be grossly enlarged but pulsations of the cardiac borders were visible. After 3 days of therapy heart size was within the upper limits of normal and his general clinical state excellent. Therapy, with cortisone intramuscularly, was continued for 10 days. Four days after cortisone was stopped, fever recurred and a further 10 day period of treatment was given. The patient was discharged from hospital without clinical evidence of cardiac involvement and remained so 12 months later.

#### CASE 7

Female, age 11 years, with established rheumatic heart disease, was admitted with evidence of acute carditis. Examination revealed a sick child in moderate cardiac decompensation, with fever, pericardial friction rub, and on fluoroscopy a grossly enlarged heart with absent pulsations of the cardiac borders. Treatment with cortisone orally was associated with a reduction in fever, pulse rate and "toxicity" within 36 hours. The friction rub disappeared in 7 days, and the heart showed a marked reduction in size within 6 days. With subsidence of the friction rub, the aortic regurgitant murmur which had been present prior to this treated episode was again heard, and an apical mid-diastolic rumble was also elicited. This latter murmur had not previously been

noted and it disappeared later during therapy. The sedimentation rate returned to normal 2 weeks after the start of therapy. It became elevated after treatment was stopped and remained so for 2 months without other evidence of rheumatic activity. At follow-up 5 months after therapy was stopped, she was well and showed cardiac findings similar to those prior to this attack.

**Murmurs.**—Seventeen patients in this series exhibited significant cardiac murmurs and in 7 a change in the auscultatory findings occurred during or shortly after therapy. Five of the 7 showed a change in apical systolic murmurs; in 3 the murmur disappeared and in 2 it diminished in intensity. Diastolic murmurs were present in 2 of these patients. In 1, with an aortic diastolic murmur, the intensity of the murmur decreased during therapy; and in the other case, an apical mid-diastolic murmur disappeared.

**Friction rub.**—A friction rub was present in 5 cases and following start of therapy persisted for a very variable length of time—between 2 and 7 days.

**Heart size.**—Cardiac enlargement, clearly demonstrated by x-ray, was present in 12 patients. In 5 there was no doubt that the enlargement was present prior to the treated episode. In the remaining cases, however, it appeared reasonable to assume that the enlargement was associated with the treated attack. A decrease in heart size was observed in 5 children (as noted above, Cases 2, 3, 5, 6, 7).

**Electrocardiographic changes.**—Prolongation of the P-R interval occurred in 13 cases either alone or in conjunction with other electrocardiographic changes, and in all instances the P-R interval shortened to normal limits. This finding is not analyzed further since the lengthening of the P-R interval may be such a variable and evanescent finding in the untreated cases that it is of little value in assessing the effect of therapy. Fifteen patients showed apparently significant changes in the amplitude of the QRS and T waves prior to and during therapy. The Q-T interval was not significantly altered, even in those cases with definite clinical evidence of carditis. The nature of the QRS and T wave changes was always in the direction of an increased amplitude during therapy.

**Chorea.**—Five patients with chorea were treated. One child whose chorea was associated with arthritis and a well marked apical systolic murmur and who was treated within a few days of onset of chorea, showed a complete subsidence of movements after a week of therapy. The second patient with chorea and an elevated

sedimentation rate, was in the third month of the disease when treatment was begun. He improved greatly concurrently with therapy but due to the length of time he had had chorea and the chance of spontaneous subsidence of symptoms, it could not be assumed that the cortisone had necessarily influenced the course of the disease. A third patient in her second episode of chorea, who showed an elevated sedimentation rate, fibrinogen and globulin, had had choreiform movements for 2 to 3 weeks prior to the institution of therapy. There was definite improvement during therapy with subsidence of all movements the week following cessation of therapy. It is of interest that an episode of chorea 8 months previously subsided without specific therapy in about the same time. The fourth patient was in her 5th week of choreiform movements and had an elevated sedimentation rate when oral cortisone was first given. During the 4th week of cortisone therapy she improved, although evidence of chorea did not entirely disappear. The choreiform movements increased after therapy had been stopped for seven days. A further course of 14 days was associated with a complete subsidence of choreic manifestations. The remaining patient with chorea had an associated arthritis. The choreiform movements had been present for 3 weeks. Treatment was continued for 3 weeks during which time the chorea subsided gradually, and movements were not evident by the end of therapy.

In all cases, subsidence of choreiform manifestations was coincident with therapy. In the first patient it seems reasonable to assume that cortisone shortened the course of the chorea. Caution must be exercised in the evaluation of treatment in the remaining four patients, since this therapy came toward the last 3 weeks of a period of 6 weeks or more of choreic manifestations, when these might be expected to subside in the natural course of the illness.

**Weight.**—During therapy there was no significant variation in weight except in 5 patients, not on restricted salt diets, who had weight gains up to 10 lb. In the period of hospitalization after therapy all except 4 patients showed a weight gain averaging 5 lb.

**Sedimentation rate.**—The sedimentation rate was elevated in all but 3 patients prior to therapy. The length of time which elapsed from onset of treatment to a normal sedimentation rate

varied somewhat with the agent which was employed. The average was 16 days (range 6 to 32 days) in the case of cortisone intramuscularly; 13 days (range 9 to 17 days) with cortisone orally; and 11 days (range 5 to 20 days) with ACTH. The response of the sedimentation rate was unusual in 4 patients. One of these had two 7 day courses of cortisone intramuscularly without significant effect on the sedimentation rate, which eventually became normal on the 11th day of the 3rd course. In the case of the second patient, the rate remained elevated during the first 11 day course of ACTH and returned to normal on the 16th day of the second course. In the remaining two patients there was not a significant fall in the sedimentation rate. (See below, Patients 1 and 4.)

In 6 cases the sedimentation rate remained normal following the cessation of therapy but in the majority it became elevated again in an average of 10 days (range 1 to 28 days) with intramuscular cortisone, 6 days (range 5 to 7 days) with oral cortisone and 8 days (range 4 to 11 days) with ACTH. Without further therapy this elevation persisted for an average of 21 days (range 4 to 36 days) after intramuscular cortisone, 31 days (range 7 to 42 days) after cortisone taken orally, and 18 days (range 4 to 42 days) after ACTH.

Clinical manifestations were associated with the rebound of the sedimentation rate in 10 patients of the 30 showing this phenomenon. In 5 of these a further course of therapy did not appear to be necessary. Four had a transient erythema marginatum and one of these showed a hyperglobulinaemia which was not present prior to or during therapy. In a fifth patient a small epistaxis was noted at onset of the rebound period and a few days later she experienced a transient painful slight swelling of a small joint. In the remaining 5 patients, noted below, clinical manifestations were sufficiently severe to warrant a further course of treatment.

*Eosinophil count.*—The eosinophil count was carefully observed before and during therapy. Many variations were noted which are not easily explained. However, in the majority of cases the maximum fall was evident between 2 and 18 days, and occurred sooner in patients treated with ACTH than with cortisone.

*White cell count.*—There was a considerable variation in the pre-treatment white cell count which ranged between 3,700 and 25,000. With

therapy the peak count averaged 20,200 (range 8,200 to 36,200) and was reached in an average of 12 days (range 3 to 22 days). Of 3 patients not showing a rise, 2 had a satisfactory course and 1 relapsed.

*Hæmoglobin.*—The average level before treatment was 11.8 gm. (range 7.8 to 13.8 gm.). During treatment the hæmoglobin rose in all but 4 patients by an amount averaging 1.9 gm., over an average time of 15 days (range 5 to 40 days).

*Biochemical findings.*—The changes noted in sodium and chloride metabolism are similar to those observed by others. Under therapy there was a tendency to sodium retention with a consequent rise in serum sodium levels. Restriction of salt intake partially controlled this hypernatraemia. Although the chlorides did not deviate greatly from the normal values, there was a tendency to some lowering of chloride values during therapy. Total cholesterol content of the plasma tended to rise during therapy.

In 7 of 14 patients in whom protein determinations were made before treatment, there was a hyperglobulinaemia. Protein determinations were made in a larger number of patients shortly after therapy was begun and in 17 of 25 the globulin was similarly elevated. Under therapy the globulin level fell to normal or below in 2 to 3 weeks. Fibrinogen levels fell during therapy roughly paralleling the falling sedimentation rate.

Reappearance of clinical manifestations occurred in 5 of the 39 cases, 4 to 6 days after cessation of therapy. Three of these had clinical evidence of serious carditis and 2 did not. These 5 patients were treated initially with courses of 21 days or less. Following an additional course of treatment, they showed the usual elevation of sedimentation rate but did not exhibit clinical manifestations. In addition to these 5 patients, whose symptoms reappeared within a week of stopping therapy, 4 patients had recurrent episodes of acute rheumatic fever which occurred 1, 2½, 4 and 6 months respectively following completion of therapy.

In the assessment of any therapy the study of those patients who do not respond is of equal importance with the survey of those who do. It was observed that out of 34 patients (the 5 patients with chorea are discussed separately in this regard) there were 5 children who showed no apparent response to treatment. In brief they are as follows:

## CASE 1

Female, age 14 years. Apparent recurrent low-grade rheumatic fever of a year's duration with manifestations of being unwell, pallor, listlessness, mitral valvular involvement, and elevated sedimentation rate. Although the sedimentation rate was lower at times during therapy, it again became elevated and there was no evidence of improved clinical state. This patient was treated for 6 weeks with cortisone intramuscularly.

## CASE 2

Male, age 10 years. Long-standing rheumatic heart disease with extensive valvular involvement and chronic cardiac decompensation. He experienced severe anginal-like attacks, the frequency of which was possibly reduced during 3 weeks' therapy with cortisone orally; otherwise there was no change.

## CASE 3

Female, age 8 years. Second episode of rheumatic fever of at least 2 months' duration prior to therapy, and with apical systolic and diastolic murmurs. During 5 weeks of therapy with cortisone intramuscularly no change occurred in the patient's status apart from a fall in sedimentation rate, which rose again and remained elevated after treatment was discontinued. It is of interest that a long time after therapy (2 months), there was an abrupt change in auscultatory findings with a decrease in intensity of the systolic murmur and disappearance of the apical diastolic component.

## CASE 4

Male, age 7 years. Appearance of rheumatic manifestations following scarlet fever. Treatment was started 2 months after onset of symptoms. There was no change in his sickly appearance or in the slight apical systolic murmur, and no drop in the sedimentation rate during treatment with cortisone intramuscularly for 3 weeks. The sedimentation rate gradually returned to normal over the subsequent four months.

## CASE 5

Female, age 4 years. One probable prior rheumatic episode. She had experienced joint pains 2 months prior to therapy, and showed an apical systolic murmur of moderate intensity. The sedimentation rate was normal at time of treatment. There was no change in the auscultatory findings during therapy with cortisone intramuscularly for 3 weeks.

## SIDE EFFECTS OF HORMONE THERAPY

Almost all patients revealed some side effect of therapy as follows: rounding of the face in 32; abdominal fullness in 14; acne in 4; buffalo hump in 2; transient glycosuria in 12; purple striae in 1; hirsutism in 15. Liver enlargement was observed in 9 instances and did not appear to be associated with cardiac decompensation. A paronychia developed in 2 patients while on therapy. There was marked flushing of the face in 3 patients on ACTH.

## SUMMARY

1. 39 children with rheumatic fever, including 5 with chorea, between the ages of 3½ and 15 years, were treated with cortisone intramuscularly or orally, or with ACTH.

2. Reappearance of clinical manifestations occurred in 5 of the 39 cases, 4 to 6 days after cessation of therapy. In addition to these 5, 4 patients had recurrent episodes 1, 2½, 4 and 6 months respectively following completion of therapy.

3. Out of 34 patients (the 5 with chorea are excluded, in this number) 5 children showed no apparent response to therapy.

4. Nine patients had had one or more prior episodes and their response to treatment in the recurrent acute phase appeared to be as satisfactory as those treated in the first attack.

5. The ready response of fever, pulse rate, arthritis and sedimentation rate; the rising haemoglobin, fall in globulin and fibrinogen, are similar to the reported experience of others.

6. All 5 patients with chorea improved concurrently with therapy but in only one case did it appear without doubt that therapy had influenced the course of the illness.

7. Seven patients were acutely ill with acute carditis. All showed an excellent response to therapy within 48 hours and 2 left hospital without clinical evidence of cardiac involvement. A decrease in heart size was observed in 4 children.

8. There were 17 patients in the whole group in whom significant cardiac murmurs were heard, and in 7 a change was noted. Apical systolic murmurs disappeared in 3 patients during or shortly after therapy, and diminished in 2 patients. An aortic diastolic murmur diminished in intensity in 1 instance and an apical mid-diastolic rumble disappeared in another.

These patients were treated under the direction of the Sub-committee on Cortisone and ACTH of The Children's Memorial Hospital—Drs. Alton Goldbloom, Alan Ross, Eleanor Harpur and Frances McCall (Chairman).

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# TWENTY-SIX CASES OF ASYMPTOMATIC DUODENAL ULCER\*

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AMONG PATIENTS attending the gastro-intestinal Clinic of Westminster Hospital during the past few years, one of us, (J.H.G.), observed ulcer patients, who at some time in the course of their disease were asymptomatic and yet showed positive radiological evidence of an active ulcer. At first it was thought that the radiographic diagnosis must have been incorrect. Later, as the number of these cases increased, it became apparent that there is a group of patients who have an asymptomatic, active duodenal ulcer with positive x-ray findings. Gill<sup>1</sup> discussed this type of ulcer and described one case. Ivy, Grossman and Bachrach<sup>2</sup> mention the occurrence of this syndrome.

It was felt it would be of value to review the 26 cases we have collected in an attempt to learn whether they form a distinct group, apart from the absence of symptoms, among patients with the ulcer syndrome. Patients who had undergone vagotomy<sup>3</sup> prior to their asymptomatic period and those who had a history of associated gastric ulcer, were excluded from the series. The latter group was not included because of the impossibility of distinguishing the benign from the malignant gastric ulcer on radiological examination.

The cases were reviewed, categorizing the patients with respect to: (1) Duration of symptoms, if any had ever been present. (2) Age. (3) Radiographic visualization. (4) Complications. (5) Gastric acidity. (6) Discovery of the ulcer.

1. *Duration of symptoms.*—Of the 26 cases, 25 (96%) had at some time or other experienced symptoms typical of duodenal ulcer. One patient had never suffered from any gastro-enterological complaints, and came to hospital because of a single episode of hæmatemesis. During the investigation, a duodenal ulcer was found on x-ray examination. The patient was placed on conservative ulcer management and discharged after an uneventful period of hospitalization. The length of time symptoms had been present

TABLE I.

Case No.	Age	Duration of symptoms in years	Number of times ulcer seen on x-ray	Complications
1	30	2	2	None
2	31	2	3	None
3	33	4	1	None
4	33	4	1	None
5	25	6	1	None
6	35	2	4	None
7	38	2	2	None
8	47	4	1	None
9	23	3	2	None
10	37	8	2	None
11	25	3	2	Vagotomy and pyloroplasty
12	39	5	2	None
13	60	28	2	None
14	30	6	1	None
15	20	1	1	None
16	26	5	1	None
17	25	3	3	None
18	36	6	1	None
19	43	6	1	Subtotal gastrectomy with anterior gastroenterostomy and vagotomy.
20	37	8	0	Perforation
21	22	3	1	None
22	59	2	1	Death from heart disease
23	34	5	2	None
24	70	No history of symptoms	2	Hæmatemesis
25	31	6	2	None
26	24	4	1	None

prior to the radiographic visualization of the asymptomatic ulcer, varied from 1 to 25 years (see Table I), averaging six years for the whole group.

2. *Age.*—The average age of these patients was 35 years, the youngest 20, the oldest 70 (Table I).

3. *Radiographic visualization.*—Patients whose radiographic examination showed only presumptive signs of an active ulcer, that is, those whose x-ray failed to demonstrate the presence of an ulcer crater, were excluded from the study. In all of the cases, other signs of activity and previous healing, such as scarring and hypermotility, as well as an ulcer crater, were observed. In some instances, localized tenderness on deep abdominal palpation was noted. In 12 cases (46%), the ulcer was seen on one examination only, while the patient was asymptomatic (Table I), in 10 (38%) it was visualized on two occasions, and in 2 patients (8%), three times. One patient demonstrated an ulcer on four oc-

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casions over the course of a year, during which time he remained symptom-free. One patient came to hospital because of perforation, and radiological examination was not carried out.

4. *Complications.*—Of the 26 cases, 21 (81%) have not experienced any complication or come to operation to date (Table I). The remaining five have suffered the following complications: (a) One had a perforation of an anterior duodenal ulcer while asymptomatic. (b) One experienced an episode of hæmatemesis. In this case the hæmorrhage was the initial symptom. (c). Two have had surgical treatment. One underwent subtotal gastrectomy with anterior gastroenterostomy and vagotomy, and one had a pyloroplasty with vagotomy.

5. *Gastric acidity.*—In 6 patients, gastric analysis was carried out during the symptomatic period and again during the asymptomatic phase of the same hospitalization (see Table II). In two cases (No. 4 and 9), there was a significant reduction in free hydrochloric acid. The remainder showed little or no change in gastric acidity.

TABLE II.

GASTRIC ACIDITY		
Case No.	Patient symptomatic	Patient asymptomatic
1	HCl = 66 Total = 82	HCl = 50 Total = 75
3	HCl = 33 Total = 42	HCl = 34 Total = 46
4	HCl = 73 Total = 85	HCl = 32 Total = 48
8	HCl = 60 Total = 80	HCl = 38 Total = 58
9	HCl = 94 Total = 104	HCl = 48 Total = 60
22	HCl = 48 Total = 67	HCl = 40 Total = 80

6. *Discovery of the ulcer.*—In 20 cases (77%), the ulcer was found during x-ray examination, following three weeks' conservative management, during which time the symptoms had completely subsided, but the lesion had persisted. In some of these, the radiologist stated that the crater had diminished in size, but in others, it had remained unchanged. In 4 patients (15%), the ulcer was visualized on radiographic examination during a periodic visit to the Clinic. These patients had all had exacerbations before, but at the time were without symptoms, and had been so for at least two months. One 70 year old man came to the Clinic because of hæmatemesis,

and one suffered a perforation during a period of remission.

Case No. 17 is described in detail.

J.C., a 25-year old white male, first noticed epigastric distress in the summer of 1944, coming on approximately 2 hours after meals and relieved by food and alkalis. In January 1945, he suffered a perforation of an anterior duodenal ulcer, which was repaired successfully. He remained free of symptoms until July, 1946, when he experienced a typical exacerbation. Another period of epigastric distress brought him to hospital on November 6, 1947. Examination at that time revealed tenderness over a right paramedian abdominal scar, and the presence of occult blood in the faeces on two occasions. Gastric analysis—free hydrochloric acid 32; total acidity 60. By November 15, the patient was free of symptoms, but on radiological examination, an ulcer was demonstrated. On December 1, a repeat gastrointestinal series revealed the lesion to be unchanged in size or position. He was discharged on December 3 and instructed to continue on ambulatory ulcer management. On September 24, 1948 and again on March 21, 1949, the patient returned to the Clinic with no history of recurrence of symptoms. On the former occasion the radiologist reported continued activity of the duodenal ulcer. X-ray examination on the latter visit was not carried out. The patient has not returned to the Clinic since 1949.

#### SUMMARY

Twenty-six patients with asymptomatic duodenal ulcer have been studied with respect to age, duration of symptoms, frequency of visualization by radiographic examination, complications, gastric acidity and the circumstances under which the lesion was discovered. There appears to be a definite group of patients who at some time in the course of their disease exhibit the radiological signs of an active lesion, but who are free of symptoms. Apart from this, they do not seem to differ from a random group with the ulcer syndrome. It indicates, however, our fundamental lack of understanding of the mechanism of pain-production in patients with duodenal ulcer.

Acknowledgment is gratefully expressed to Dr. Paul Hauch, Radiologist-in-Chief, Westminster Hospital; Dr. C. MacLeod, Hospital Superintendent; the Photographic Department, and Dr. John A. Lewis for suggestions.

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Bovine tuberculosis, once the scourge of American dairymen, has been almost entirely eradicated, according to Dr. B. T. Simms, of the U.S. Department of Agriculture, who reported that of 8,000,000 cattle tested last year only 0.19 per cent reacted.

## THE RETINAL VESSELS OF THE FUNDUS OCULI IN HYPERTENSION\*

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THE YEAR 1951 marks the centennial of the invention of the ophthalmoscope by Helmholtz. Four years after his discovery, von Graefe<sup>1</sup> first described the ophthalmoscopic appearance of the retinal vessels. Over the years there has followed a great deal of study and controversy in this subject by many outstanding authorities. In the past few years interest has been renewed in the hope that by a more careful sustained observation of the retinal vessels one might help elucidate the mechanism of hypertensive disease. Bjork's<sup>2</sup> monograph and Ayoub's<sup>3</sup> review are two of the most recent publications that include very complete bibliographies.

The Nordenson fundus camera has given a new key with which to observe the progressive changes in the fundus, and collections of coloured transparencies such as have been assembled by Bedell, of the progressive changes in the individual case, have followed. Again the fundus oculi as an indication for thoracolumbar sympathectomy, as outlined by MacLean<sup>4</sup> has added a further stimulus for a careful observation of the retinal vessels.

At McGill University our interest is twofold: We believe that a critical examination of the retinal vessels is not only fruitful in assessing the progress of disease but also of great training value to the student who is learning the use of the ophthalmoscope for the first time. Our aim is to train the student to observe and describe the fundus in detail, similarly to the writing up of a microscopical preparation. Moreover, patients showing hypertensive and arteriolar sclerotic changes in the fundi are usually plentiful for demonstration in the medical wards.

A new terminology as compared to the older writers has been evolved to express a more exact classification of these vascular changes. In our teaching and consultation reports we are using the terminology and classification as given by Nicholls<sup>5</sup> in Stallard's textbook.

The term retinopathy has replaced retinitis and is reserved for describing fundi complicated with hæmorrhages, exudations or œdema of the

optic nervehead. Thus fundi with cotton-wool exudates, flame-shaped hæmorrhages or retinal œdema are referred to as fundi with retinopathy and changes in the vessels themselves without such complications are described as present without retinopathy.

Previously the retinal vessels have been termed retinal arteries and veins, whereas in reality in the histological and physiological sense they are arterioles and venules. The true structure of the central artery and vein ceases at the point where they branch. These latter terms have therefore been substituted for the former. It follows that in the fundus what we are describing is arteriolar sclerotic changes. These changes are found by searching along the four branches of the arterioles which supply the four quadrants of the fundus and each should be accurately studied. This should be done in a darkened room and the pupils should be dilated. A useful weak mydriatic for this purpose is a lamella of eucatropine gr. 1/40 broken in half, one for each eye. After the examination this can be neutralized by instilling a little eserine ointment 1/4%.

The retinal vessels are examined for the following characteristics and each point graded as mild, moderate, marked and severe. Primary hypertensive changes are recognized by three important signs: general narrowing of the arterioles; focal constriction of an arteriole; compression changes at the arteriole-venule crossings.

The differentiation of arteriolar sclerosis from simple hypertensive changes is the addition to the above of: loss of translucency of the arteriole; loss of transparency as exhibited by a broadening or irregularity of the light streak which may advance to the copper-wire and finally the silver-wire appearance. Perivascular white sheathing may occur and has been described as parallel or pipe-stem sheathing. The terminal branches of the arterioles, particularly in the macular region, may become tortuous radicles and are described as corkscrew vessels.

Hypertensive changes alone may be of a spastic nature and can regress, but when arteriolar sclerosis ensues these changes are permanent. The generalized narrowing of the arterioles is more easily appreciated by a comparison with the venules. The normal calibre ratio of venule to arteriole is as 5 is to 3. Grading of the amount of narrowing has been suggested as follows:

Grade 1. V:A = 3.5 is to 2; grade 2. V:A =

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as 2 is to 1; grade 3. V:A = as 3 is to 1; grade 4. V:A = as 4 is to 1.

In cases of hypertension one's experience must help to decide if the venule is engorged or the arteriolar calibre narrowed.

Focal constriction or focal sclerosis of an arteriole is a term used to describe variations in calibre of the arteriole which may show localized narrowing as judged by the breadth of the blood column. It may occur in one vessel only or have a patchy incidence in several vessels. It is commonly due to atherosclerosis but can be caused by a localized spastic contraction. This latter is seen best in cases of toxæmia of pregnancy. Focal sclerosis is graded as occasional, few, many or marked.

The arteriolar-venule crossings are perhaps the easiest and most distinctive site at which to observe changes. These are graded as compression, depression, concealment and marked constriction. The normal arteriolar wall is sufficiently translucent to see the venule beneath. The earliest sign of sclerosis is decreased translucency of the arteriole, which hides the venule making it indistinguishable at the spot where it is crossed (Gunn's sign). A greater compression makes the venule invisible for some distance on either side of the arteriole and even aneurysmal-like swelling may occur in the venule

distal to the optic disc. Deflection of the venule (Salus's sign) is a term which describes the acute angulation of the venule as it passes beneath the arteriole. This sharp bending, usually outward, can occur in hypertension alone but it is also found in advanced sclerosis due to organic changes in the vessel walls. Another point to note is a white perivascular sheathing of the arteriole as it passes over the venule. Or again, the venule may be deflected inwards rather than outwards. This is considered a definite sign of atherosclerosis.

It is these signs in the vessels themselves rather than the more spectacular changes of retinopathy that are of importance in assessing the fundus oculi in cardiovascular hypertension.

#### SUMMARY

A review of the points necessary to observe in a critical ophthalmoscopic examination of the retinal vessels in hypertension is made and the current terminology in recording of these is given.

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#### EARACHE\*

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IN DEALING with earache it is well to remember that the severity of the pain may bear little relation to the gravity of the condition causing it. For example, a furuncle of the external auditory canal may cause excruciating pain while a dull, deep-seated earache may be the only sign of an acute mastoiditis or an impending intracranial complication. The causes of earache may be conveniently considered to be either extrinsic or intrinsic in site.

#### INTRINSIC CAUSES

Foreign bodies are a fairly common occurrence in children. The organic bodies such as peas,

beans, etc., swell from absorbed mixture causing severe pain and may be very difficult to remove. Inorganic objects as beads, stones etc., will cause pain simply because of mechanical irritation. Cerumen if in contact with the tympanic membrane, or if very hard, may cause pain and sometimes vertigo.

Furuncle of the external auditory canal is common. Pain usually is intense as the skin is very adherent to the periosteum and perichondrium and there is consequently little loose tissue to permit swelling. If the furuncle is in the posterior wall the accompanying oedema may obliterate the posterior auricular groove and simulate an acute mastoiditis. Two points are of value in connection with this in differentiating the one from the other, *i.e.*, in furuncles the pain is accentuated by movements of the jaw and auricle while the tympanum and hearing acuity are unaffected. It not infrequently happens that

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a furuncle occurs in the presence of an acute or chronic suppurative otitis media. The decision then as to the cause of the mastoid oedema may be difficult or impossible. In this case the mastoid should be explored, as the risk of doing this is small as compared to leaving an infected mastoid without drainage.

Chronic external otitis in which the canal is uniformly red and swollen may be quite painful. This type of infection was formerly thought to be of fungus origin but is almost always bacterial.

Acute otitis media is the commonest cause of earache. It is almost always secondary to nasal or nasopharyngeal infection and most often occurs in children. The usual course of an acute earache relieved by drainage, or resolution without external drainage, followed by subsidence of the infection in a matter of a few days is well known. Aided by antibiotic or sulfonamide therapy the course of most acute otitis media is short in these days. However some cases are very resistant to treatment and deep earache or post-auricular pain occurring two to four weeks after the onset of the infection should direct one's attention to a developing acute mastoiditis. In addition to this often seen type of infection due usually to the streptococcus or staphylococcus are some less common and less well recognized variations that merit attention. One of these is the acute otitis media due to pneumococcus, type iii. Here the initial earache may be severe, relieved by surgical or spontaneous drainage and followed by purulent discharge that is not profuse or of long duration, especially in the presence of antibiotics. The infection may appear to subside but the tympanum does not quite return to normal, remaining red in Shrapnell's area. If treatment is not then pursued with heavy antibiotic therapy the infection becomes quiescent for a period amounting to weeks and then manifesting itself as meningitis, brain abscess or other intracranial complication. At the onset of the original infection it appears similar to all others, but later there are certain characteristics that suggest a pneumococcal organism. Even after the cessation of discharge and pain the tympanic membrane remains, in its upper part, dull, red and swollen and the hearing is diminished out of proportion to the apparent disease in the middle ear.

The other variation that I have mentioned is the chronic, or recurrent acute, otitis media oc-

curring in children and due to a partly obstructed Eustachian tube. This form manifests itself as a painless, progressive or recurrent deafness, or as repeated attacks of a painful otitis media, with or without suppuration. This partial occlusion of the Eustachian tube is secondary to hypertrophy of the lymphoid, or adenoid, tissue in or near the nasopharyngeal orifice. In the presence of allergy or chronic infection of the tonsils, adenoids, or paranasal sinuses the nasopharyngeal lymphoid tissue hypertrophies and frequently results in the course of events noted above. If this interference with normal patency of the Eustachian tube is permitted to persist the middle ear will eventually become chronically diseased with some degree of permanent deafness resulting. However if the enlarged lymphoid tissue is removed early the middle ear may be restored to normal. One of the points I wish to make with these remarks is that destructive changes may be taking place in the middle ear in the complete, or nearly complete, absence of pain.

Chronic otitis media is not usually painful. When pain occurs it does so because of retained secretion or because of a developing intracranial complication. The pain here is a dull, deep-seated earache or post-auricular pain, or parietal headache, and indicates meningeal irritation. Such extension of the disease to deep structures may or may not be preceded by an acute exacerbation of the infection and accompanied by a change in the patient's mental well-being.

#### EXTRINSIC CAUSES

In order to better indicate the mechanism of the reflex earache I would like to outline the sensory innervation of the auricle, external auditory canal and the middle ear. Sensation in these structures is supplied by 5, 7, 9, 10 cranial nerves and 2, 3 cervicals.

*Fifth nerve.*—The third division through the auriculo-temporal branch supplies the anterior upper wall of the external auditory canal, tragus, anterior part of the lateral surface of the auricle, membranous part of the posterior wall of external auditory canal and tympanic membrane.

*Seventh nerve.*—The facial nerve includes sensory fibres in addition to motor and chorda tympani fibres. From the geniculate ganglion itself arise the great and small superficial petrosal nerves both of which in their course give off fibres taking part in the formation of the tym-

panic plexus, the main trunk continuing on to the sphenopalatine or otic ganglion respectively. The great superficial petrosal joins the great deep petrosal, from the tympanic plexus, to form the Vidian nerve and continue on to the sphenopalatine ganglion. Other sensory connections are thought to exist with the vagus and glossopharyngeal through the auricular branch.

*Ninth and tenth nerve.*—The auricular branch, Arnold's nerve, supplies fibres to the bony part of the posterior wall of the external auditory canal, a strip of the posterior surface of the auricle, and posterior half of the tympanic membrane and mastoid area.

The sensory supply to the middle ear is in the form of a plexus lying on the promontory. It is formed mainly by Jacobson's nerve from the ninth plus fibres from the geniculate ganglion and carotid plexus. As noted above connections exist between this plexus and the sphenopalatine and otic ganglia.

Cervical nerves 2-3, supply by the greater auricular branch the helix, anti-helix and posterior surface of the auricle and mastoid area. Central connections exist between the cervical and trigeminal nuclei.

The general sensory supply of the upper food and air passages is also from the 5th, 9th, and 10th nerves. More specifically the trigeminal supplies the anterior half of the palate, anterior 2/3 of the tongue (lingual branch of mandibular) and mucosa of the cheek. The glossopharyngeal supplies posterior half of the palate, posterior 1/3 of the tongue and the palatine arches. The pharynx receives its sensory fibres from the glossopharyngeal and vagus. The larynx is supplied by the vagus mainly by way of the superior laryngeal branch. The nose and nasal passages receive sensory fibres from the first two divisions of the trigeminal.

From the indicated nerve supplies and connections it is seen that pain referred to the ear may in fact originate in any structure supplied by these nerves and well removed from the ear, *i.e.*, from the parotid gland, nose and adnexa, nasopharynx, pharynx, tongue, teeth, temporo-mandibular joint, larynx and neck.

Diseases of the mandible are a common source of referred earache. Severe and intractable earache may result from such dental conditions as unerupted or impacted third molars, dental abscess and osteitis. It is a wise precaution to have x-ray examination and dental

opinion if there is any reason to suspect dental disease.

Dysfunction of the temporo-mandibular joint frequently results in a combination of otalgia and other ear symptoms. Erosion of the glenoid fossa may result from overbite or from reduction in size, or absence, of the molar teeth. The condyle may press upon the auriculo-temporal nerve causing pain in front of the ear. Overclosure of the joint may interfere with function of the Eustachian tube resulting in fullness of the ear, tinnitus and sometimes impaired hearing.

The area supplied by the glossopharyngeal, *i.e.*, the pharynx, is the source of many earaches. A commonly occurring form of glossopharyngeal neuralgia is the earache in the recently tonsillectomized patient, especially children. In the rare glossopharyngeal tic there is frequently radiation to the ear, in addition to the local pain in the pharynx. A subacutely inflamed tonsil or its adjoining inflamed lymph gland will often cause earache, sometimes this being the presenting complaint. Carcinoma of the tonsil, palatine arches or nasopharynx will often indicate its presence by earache, by reason of pain in the adjacent gland as well as in the primary lesion.

In the larynx, through its vagal connections, the ulcerating and invasive lesions of tuberculosis and carcinoma may be a source of earache.

An unusual cause of earache is herpes zoster oticus described at length by Hunt. The occurrence of pain along the distribution of the facial nerve may be accounted for by the presence of sensory fibres in the facial trunk which, according to Hunt, are somatic to the external middle and internal ear and tympanum. Clinically herpes oticus may and usually does give severe earache. Depending on the extent of the herpetic process there may be facial paresis or paralysis, disturbance of equilibrium and deafness. The vesicles are characteristically marked in the concha of the auricle and also occur on the homolateral soft palate. There are also disturbances of lachrymation and loss of taste in the anterior 2/3 of the tongue and soft palate. The vesicles on the soft palate suggest that the herpetic process may involve secretory as well as pure sensory fibres.

One of the most common of all headaches is that caused by hypertonicity of the neck muscles. hypertonic neck muscles may refer pain to any area but it is more usually occipital, radiating to the frontal area, the "lead cap" headache, or be-

tween the shoulders, and even hemicranial. The pain varies in intensity and may be confused with that of meningitis, dental disease, sinusitis, otitis or mastoiditis. The more common causes of this type of pain are rheumatoid myositis, fibrositis, neuritis and arthritis, while emotional stress is felt to be of great etiologic importance. The neural mechanism of the neck structures is intimately connected with that of the nose via the third nerve nucleus and adjacent centres in the midbrain.

Irritation of the sphenopalatine ganglion may result from such nasal conditions as septal spurs, chronic sinusitis, especially sphenoid sinusitis although generally nasal conditions are not often the cause of referred earache. Reflex otalgia, common in Vidian neuralgia, is mediated through the ramus cutaneous of the facial to the

auricular and mastoid region. It may also be due to impulses from the vagus or from the tympanic nerve (originating from the glossopharyngeal and running to the middle ear and connecting with the great superficial petrosal nerve).

In closing I would like to repeat two points; first, that the severity of the earache is not a good indication of the severity of the disease and, second, that earache may be an early symptom of serious disease of the upper respiratory or food passages. I would also like to remind you that the appearance of the tympanic membrane and the hearing acuity are important signposts in middle ear disease as the former is almost always abnormal and the latter always impaired. Having excluded the ear as a source of pain its cause will be found elsewhere in the head or neck.

#### PRACTICAL ASPECTS OF FLUID AND ELECTROLYTE BALANCE\*

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THE IMPORTANCE of maintenance of fluid and electrolyte balance is well recognized but accurate maintenance in the presence of certain pathological states may present a difficult problem. Frequently the degree of imbalance, and the underlying causes of it, remain unrecognized. The purpose of this article is to discuss these problems as they occur in surgical patients, although the general approach is similar in all types of cases, whether surgical or medical. Specific variations occur only as do variations in the underlying disease processes.

Before, during, and after major surgical procedures close attention must be paid to fluid and electrolyte balance, particularly in those cases where oral intake is difficult or impossible and dependence must be placed on parenteral methods. Marked deviation from normal is especially seen in those conditions involving the gastro-intestinal tract, such as peritonitis, ileus, or resection of part of the tract. Such imbalances should be prevented or else corrected without

delay. In order to do this properly a thorough understanding of the basic principles involved is required. Overzealous or improper treatment may aggravate the condition and make its final correction more difficult; a very common error, for example, is the administration of large quantities of saline solution in the absence of abnormal losses of sodium and chloride ions.

The fluid and electrolyte requirements of the patient may be divided into three groups: (1) baseline requirements; (2) dynamic losses; (3) static deficits. When these three requirements are kept in mind it is possible to administer the required amounts of fluid and electrolytes with considerable accuracy. Accurate quantitative replacement of deficits is the quickest way to restore the patient's physiologic balance and places the least strain on the liver, cardiovascular system, kidneys and other organs whose functions may already be impaired.

In any consideration on this subject appropriate terminology should be adopted, and that advocated by Gamble<sup>1</sup> is the best. In it the concentrations of various electrolytes are expressed in terms of milliequivalents per litre, in preference to milligrams per 100 c.c. (Table I). Although confusing at first to those accustomed to thinking in terms of milligrams per 100 c.c., this terminology permits a greater understanding of the presenting condition. It is based on the fact that molecular weights of all substances contain

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equal numbers of molecules ( $6.06 \times 10^{23}$ ). The relationship of electrolytes, or their equivalence to one another, is of great importance because, normally in body fluids, the sum of the positively-charged ions bears a constant and approximately equal relationship to the sum of the negatively-charged ions. Knowledge of the rela-

TABLE I.

NORMAL SERUM VALUES		
meq/L	Ion	mgm. %
141.0.....	Sodium	324.0
4.3.....	Potassium	17.0
103.0.....	Chloride	366.0
27.0.....	Bicarbonate 60 vol. % (CO <sub>2</sub> )	
5.0.....	Calcium	10.0

The above figures are the average normal serum electrolyte levels in human adults during health. There is, of course, a slight range of normal variation in health, but it is of no great significance.

Conversion of concentrations of these ions from mgm. % to meq/L may be accomplished as follows:

Na.....	mgm. per 100 cc. X 10 ÷ 23
K.....	" " " 10 ÷ 39
Cl.....	" " " 10 ÷ 35.5
Ca.....	" " " 10 X 2 ÷ 40
HCO <sub>3</sub> .....	CO <sub>2</sub> C.P. as vol. % ÷ 2.24

tionship between ions in equilibrium is basic if disturbed electrolyte balance is to be returned to normal—thus our preference for expressing electrolyte concentrations in milliequivalents per litre (meq/L).

#### I. BASELINE REQUIREMENTS OF THE PATIENT

Baseline requirements may be divided into four classes: water, electrolytes, carbohydrate and others.

##### 1. BASELINE REQUIREMENTS OF WATER

Water must be provided to replace the following physiologic losses:

(a) *Urine*—1,000 to 1,500 c.c. per day. Normally the kidney is capable of concentrating the urine to 1.2 osM of solutes per litre, which is approximately four times the concentration in plasma (310 mosM/L). At this concentration 0.5 osmoles of solute would require a minimal urine volume of approximately 400 c.c. for excretion.

The minimal solute output of the starving adult is about 0.3 to 0.4 osmoles per day, and with normal renal function the minimal urine volume would be about 350 c.c.; but the kidneys of a surgical patient should never be considered

to have a concentrating power of more than 0.6 osmoles per litre of urine. Hence the allowance of water to provide the kidneys with an adequate volume with which to function is arbitrarily set between 1,000 and 1,500 c.c. per day.

(b) *Respiratory loss*—500 to 800 c.c. per day.

(c) *Vaporization from skin surface*: (1) insensible perspiration—200 to 300 c.c./day; (2) sweat—100 to 300 c.c./day, with a comfortable environmental temperature. The total baseline requirement is, therefore, 1,800 to 2,900 c.c. of water per day, with the average requirement falling between 2,000 and 2,500 c.c.

The baseline water requirement of a normal individual is met roughly as follows: (a) water drunk, 1,200 c.c.; (b) water in food, 750 c.c.; (c) water of oxidation, 300 c.c., making 2,250 c.c. per day.

Examples of circumstances increasing the baseline water requirement are: hot weather (sweat), elevated basal metabolic rate, fever, youth, infancy (marked), thin vigorous type of subject, medical diaphoresis. Those decreasing the water requirement are: myxoedema, advanced age, cardiac failure, nephritic oedema, renal oliguria.

#### 2. BASELINE ELECTROLYTE REQUIREMENTS

Normally the average intakes of the extracellular electrolytes are as follows: Na, 60 to 100 meq/day; K, 40 to 75 meq/day; Cl, 80 to 110 meq/day.

The average NaCl intake per day is between 3.5 and 6.0 gm. This indicates the fallacy of giving large quantities of saline solution post-operatively when a patient is receiving parenteral fluids only. The baseline intake of Na and Cl should be approximately 76 meq of each per day, which are contained in 500 c.c. of 0.9% saline solution. Even this amount of saline should be reduced in certain circumstances, such as old age, postoperative shock, dehydration and depressed renal function.

#### 3. BASELINE CARBOHYDRATE REQUIREMENT

Approximately 15 to 25 gm. of nitrogen are lost per day during starvation. One hundred grams of glucose will reduce this loss by approximately 50%, owing to its protein-sparing effect.<sup>2, 3</sup> However 200 gm. of glucose per day will reduce nitrogen loss by little more, a negligible increase over the sparing action of 100 gm. The minimal demand for glucose is, therefore, 100 gm. per day (2,000 c.c. of 5% glucose solution).

Other functions of parenteral glucose are: (1) replacement of acute glycogen deficiencies as may occur after surgery, (2) prevention of starvation ketosis, (3) correction of acute hypoglycæmia, (4) aid in correction of water dehydration, since a portion of glucose metabolized yields water, and (5) supplying of calories for the daily maintenance of the patient.

#### 4. OTHER BASELINE REQUIREMENTS

These include vitamins, particularly ascorbic acid, thiamine and riboflavin. These are rapidly depleted in the absence of intake and they are essential for proper wound healing and for the intermediary metabolism of glucose.

Amino acids administered parenterally are useful for tissue repair when more than the caloric requirement can be provided (25 calories per kgm. body weight); otherwise they are metabolized to produce energy and cannot be used, except to a small extent, to build tissue and replace nitrogen losses.

A 70 kgm. patient requires approximately 1,800 calories per day to prevent tissue destruction and to meet energy requirements.<sup>4</sup> This cannot readily be met by means of intravenous glucose solutions. Proteins have a specific dynamic action which further uses energy, whereas fat and carbohydrate do not. Therefore, intravenous fat preparations would be very desirable to provide calories, but they are not yet commercially available.

From a practical standpoint then (particularly when parenteral alimentation is expected to be required for only a few days), caloric requirements must be partially disregarded, and the aim of therapy must be to supply fluid volume and electrolytes to maintain the normal composition of body fluids.

Glucose should not be administered at a rate exceeding 0.5 gm./kgm./hour, for above this rate it exceeds the renal threshold and is lost in the urine, carrying a complement of water with it.<sup>4</sup> Recent studies with solutions of invert sugar indicate that this form of carbohydrate can be administered at rates up to 1.5 gm./kgm. body weight/hour without loss in the urine, and with almost complete utilization.<sup>4</sup> This is proving to be a useful method of providing more calories per day by the intravenous route without the necessity of prolonged infusion periods each day.

Hypertonic solutions of glucose introduce the problem of the rate of administration, which be-

comes a serious one when it is seen that 12 hours would be required to administer 3,000 c.c. of 10% glucose solution to an adult at a rate not exceeding 0.4 gm./kgm./hour. Another objection to the use of such hypertonic solutions is the marked tendency for thrombosis of veins to occur, which may create a serious technical problem.

Alcohol, which supplies 7 calories/gm., may be used as a source of calories in intravenous solutions.<sup>5</sup> It provides a sedative effect and may raise the morale of an ill patient. However, our experience shows that its use is limited and that it must be given rather slowly to avoid development of unpleasant subjective sensations.

#### II. DYNAMIC LOSSES OF THE PATIENT

Dynamic losses include all losses over and above the baseline output of fluid and electrolytes. There are two chief categories of these losses: (a) Gastro-intestinal tract losses. (b) "Third Space" effect.<sup>6</sup>

(a) *Gastro-intestinal tract losses.*—The Abbott diagram<sup>7</sup> provides a very good illustration of the fluid volume relationships within the gastro-intestinal tract and the possible losses that may occur in its disorders. Proximal to the pylorus about 4,000 c.c. of fluid are secreted in each 24 hours (1,500 c.c. of saliva, 2,500 c.c. of gastric secretion), and another 4,500 c.c. are secreted beyond the pylorus (500 c.c. of bile, 700 c.c. of pancreatic secretion, 3,000 c.c. of succus entericus). Normally reabsorption is such that only 100 to 150 c.c. of water are lost daily in the stool. All of the gastro-intestinal tract secretions are electrolyte-containing fluids and they are approximately isotonic with the extracellular fluid, although the individual ionic concentrations vary considerably from one point in the tract to another (see Table II).

Dynamic losses should be replaced quantitatively when they occur, and therapy must be adjusted to the needs of the individual patient at any particular time. There is an inescapable loss of potassium in the urine, amounting to about 10 meq/L of urine, because approximately 30% of all potassium filtered by the kidney is not reabsorbed.<sup>9</sup> In addition, there may be active tubular secretion of potassium.

Biliary and pancreatic fistula losses over 500 c.c. per day should be replaced by the intravenous route or by means of enteric-coated NaCl (with or without some  $\text{NaHCO}_3$ ). Pan-

creatic fistulae drain more when food is taken by mouth, because of stimulation by the secretin and vagus mechanisms.

(b) "Third space" effect.<sup>6</sup>—The second category of dynamic losses is intercompartmental shifts of fluid and electrolytes (which may be called the third space effect).

The working tissues of the body are energy-exchanging muscles and viscera. There are several sets of membranes across which water, electrolytes, crystalloids, colloids and cells pass at varying rates; rates which are characteristic for each membrane and for each solute con-

by F. D. Moore.<sup>10</sup> Water diffuses rapidly throughout body water (studied with heavy water) indicating great permeability of almost all membranes to it. The membranes of all the cells of the body, save those of the skin, urinary tract and the terminal segments of the renal tubules, appear to be freely permeable to water. Water crosses both the "rapid" (capillary) membrane and the "slow" (cell) membrane very quickly. Approximately 73% of blood water passes through the capillary membrane every minute. Mass shifts of water in response to dehydration and rehydration take place at a much slower rate, because water moves only as the dissolved electrolytes permit.

When sodium is injected intravenously equilibrium is reached across the capillary membrane within 60 minutes.<sup>10</sup> After this there is a much slower movement of the sodium into the cells and bone, followed by dilution and excretion. This shows that the capillary membrane is the fast membrane, whereas the cell membrane is a slow membrane. This has been confirmed by studies using chloride and bromide ions.

The potassium ion is predominantly an intracellular ion and behaves differently. Approximate equilibration is reached by 15 hours after its intravenous injection, and the curve is the resultant of forces acting across the cell membrane rather than across the capillary membrane, although the capillary membrane must be crossed in transit. The cell membrane is a "slow" membrane, and potassium shifts and gross water shifts across it occur at characteristically slower rates than across the "fast" capillary membrane.

Crystalloids have characteristic and individual rates of penetration into cells. Since the total osmotic pressure exerted by the extracellular crystalloids is inconsequential, these permeability rates are of little importance in water transfer within the organism. Only when concentrations are appreciably elevated, as in hyperglycaemia, do crystalloid concentrations begin to acquire significance in relation to water transfer.

Albumin is not confined to the plasma, but almost one-half of it is outside the blood-stream in interstitial spaces (especially in the lungs, liver, and visceral lymph tissue where the capillary is almost as permeable to albumin as it is to electrolytes). Since a colloid can exert osmotic pressure only when it faces an impermeable membrane it is clear that colloid osmotic pressure exerted by albumin is of much greater im-

TABLE II.

*GASTRO-INTESTINAL TRACT LOSSES <sup>8</sup>			
Concentration in meq/L			
	Na	K	Cl
Gastric (fasting) . . . . .	60.4 9-116	9.2 0.5-32.5	84.0 7.81-54.5
Small bowel (suction) . . . . .	111.3 82-147.9	4.6 2.3-8.0	104.2 43-137
Ileostomy (recent) . . . . .	129.4 105.4-143.7	11.2 5.9-29.3	116.2 90-136.4
Ileostomy (adapted) . . . . .	46.0	3.0	21.4
Cæcostomy . . . . .	52.5	7.9	42.5

*BILE AND PANCREATIC FISTULÆ			
Bile . . . . .	148.9 131-164	4.98 2.6-12	100.6 89-117.6
Pancreatic secretion . . . . .	141.1 113-153	4.6 2.6-7.4	76.6 54.1-95.0
Urine—normal . . . . .	40-9	20-60	40.120
—pathologic . . . . .	0.5-312	5-166	5-210
Transudates . . . . .	130-145	2.5-5.0	90.110

\*From Lockwood, J. S. and Randall H. T., *Bull N.Y. Acad. Med.* 25: 228, 1949. (Upper figures represent averages, lower figures represent the extremes encountered in their series).

cerned. The efficiency of energy transmission is reduced by changes in the composition of body fluids. Therefore, its maintenance and support are the objectives of treatment.

The energy-exchanging portion of the body consists, anatomically, of striated muscle, heart, lungs, liver, viscera and the vascular tree. The supporting and covering tissues (bone, fascia, skin) comprise about 40% of body weight, the lean body mass about 60%.

The rate at which substances move about in the water phase may be studied by radioactive and stable isotope technique, as has been done

portance for plasma volume maintenance in the periphery where the capillary is impermeable to albumin, than in the central viscera, where permeability to albumin is pronounced. This differential permeability of capillaries may explain apparent contradictions in patients with ascites but without peripheral oedema.

The red blood cell is the largest circulating particle and cannot escape from the vascular space. The importance of the red cell in the treatment of shock and hæmorrhage stems from its particle size and space-occupying property as well as from its oxygen-carrying and carbon dioxide-transporting properties.

Extracellular fluid loss, as in high intestinal obstruction with no oral intake, is almost to its maximum by 48 hours, and then it slows to an absolute maximum of approximately 30% of its own volume by 96 hours. The volume loss of the intracellular fluid will, by 96 hours, be much greater than the extracellular fluid loss, because the volume of the intracellular fluid is much greater than the extracellular volume (normally about 2.5 times as great). From a practical standpoint, almost all of the loss in the first 24 hours is sustained by the extracellular fluid, but, as stated above, in the second 24 hours the intracellular loss catches up, so to speak, and by 96 hours far exceeds it. The intracellular and extracellular volume losses are approximately equal at the end of the first 48 hours.<sup>11, 12</sup>

The Third Space is the traumatized area; burn wound, injured part in a crush wound, peritoneum in peritonitis, pulmonary tissue in pulmonary infection, etc. It is arbitrarily called the third space because it is a space in the body occupied by fluid in addition to the extracellular and intracellular spaces normally present. Effectively, fluid is lost from the body while it is in the third space.

### III. STATIC DEFICITS OF THE PATIENT

Static deficits refer to the deficiencies (although at times excesses) of water, electrolytes and blood volume of the patient when active treatment is begun. Static deficits are of four main kinds, and different combinations of these, and different amounts, may exist in any given situation: (a) Water deficit. (b) Electrolyte deficit. (c) Red blood cell mass deficit. (d) Colloid osmotic deficit (protein).

(a) *Water deficit*.—Except in very acute situations, in which the deficit has developed within

a relatively short period of time, there is an appreciable intracellular water deficit as well as an extra cellular deficit. As noted previously, the ratio of one to the other depends largely upon the time factor because of the different rates of transfer across the fast and slow membranes surrounding the body fluid compartments.

For practical purposes one is immediately concerned with the extracellular water deficits, and usually the intracellular losses can be made up in a more leisurely fashion. At times it is almost impossible to estimate the static deficit of water by means of history alone, and at other times no history is available. Hence it is occasionally very useful to estimate the extracellular water deficit from the elevation of the hæmatocrit. The following formula may be used, provided there has been no appreciable hæmorrhage and the patient was not anæmic before the onset of the acute dehydrating process:

$$\frac{(1 - \text{normal hæmatocrit}) \times 0.2 \times \text{weight in kgm.}}{\text{found hæmatocrit}} = \text{Extracellular volume deficit in litres.}^6$$

It must be realized that this is only an approximation and should be used only as a working rule, in cases of *acute* dehydration. Another similar approximation of the extracellular fluid deficit may be based on the plasma protein concentration, providing the period of dehydration has not exceeded a time interval of more than 24 to 36 hours.

(b) *Electrolyte deficit*.—With information at hand concerning the found extracellular volume and the actual concentration of the various electrolytes, it is a matter of simple arithmetic to calculate the electrolyte deficits.

(c) *Red blood cell deficit*.—Estimations of the red cell mass deficit are based on blood volume determinations, commonly made with Evan's blue dye (T-1824).<sup>13, 14, 15</sup> The normal value minus the found value yields the deficit. As a general rule, in the absence of frank hæmorrhage, the rate of replacement of the red cell mass deficit by transfusions of whole blood should not be over 1,000 c.c. on the first day, and not over 500 c.c. on the second and subsequent days.

(d) *Colloid osmotic deficit (protein)*.—This may be calculated on the basis of the plasma volume and protein concentration. Normal values minus found values yield deficits.

We do not propose to consider here the specific problems of sodium and potassium im-

balance; these have been dealt with by Randall, Habif and Lockwood,<sup>9, 16</sup> and many others.<sup>17 to 32</sup> The methods employed by us in the treatment of sodium and potassium imbalance are as described by Randall *et al.*

TABLE III.

COMPOSITION OF GENERALLY AVAILABLE PARENTERAL FLUIDS (meq/L)

Type	Na	K	Cl	Effective HCO <sub>3</sub>
0.9% NaCl.....	154	0	154	0
M/6 Sodium lactate...	167	0	0	167
0.8% Ammonium chloride.....	0	0	150	0
0.223% KCl in 5% D/W.....	0	30	30	0
Darrow's solution.....	120	35	105	50
5% Dextrose in water..	0	0	0	0
Amigen (with 0.2% NaCl).....	34	0	34	0
Normal plasma.....	141	4.3	103	27

In Table III are tabulated, in meq/L, the sodium, potassium, chloride and "effective" bicarbonate concentrations in various parenteral fluids generally available or which can be prepared when necessary. This is followed by an illustration of how one may estimate the type and quantity of parenteral fluids in the treatment

TABLE IV.

ILLUSTRATION OF ESTIMATION OF THERAPY IN A HYPOTHETICAL CASE

Information: 60 kgm. man with acute small bowel obstruction.

Hæmatocrit = 60%      Duration of illness = 48 hours. (Losing 2,000 cc. of fluid per day from the upper small bowel)

The patient is obviously depleted of both water and electrolytes.

Normal extracellular volume (ECV).  $60 \times 0.2 = 12$  L.  
 Normal extracellular Na.....  $12 \times 140 = 1680$  meq.  
 Normal extracellular Cl.....  $12 \times 103 = 1236$  meq.  
 Found extracellular volume.....  $12 - 3 = 9$  L.  
 (— from  $(1 - 45) \times 0.2 \times 60 = 3$  L. ECV deficit)

60  
 Found extracellular Na.....  $9 \times 117 = 1053$  meq.  
 Found extracellular Cl.....  $9 \times 85 = 765$  meq.  
 Deficits: of Na.....  $1680 - 1053 = 627$  meq.  
           of Cl.....  $1236 - 765 = 471$  meq.  
           of water.....  $12$  L -  $9$  L =  $3,000$  cc.

## Replacement therapy

	Water	Na	Cl
I. Baseline.....	2,500	76	76
II. Dynamic loss.....	2,000	240	200
III. Static deficit.....	3,000	627	471
Totals.....	7,500	943	747

of a hypothetical patient with acute small bowel obstruction present for 48 hours. This illustration is designed to show what can be done with minimal laboratory information as a guide.

The above amounts would be necessary to replace the extracellular static deficit and carry the patient for the first 24 hours. Ordinarily it would be preferable to make up the static deficit over a period of 48 hours, rather than in 24 hours. Therefore, in the first 24 hours one could administer approximately 6,000 c.c. of fluid containing 600 meq of Na, 450 meq of Cl, 100 gm. of glucose (or more) and the daily requirements of vitamins.

TABLE V.

PARENTERAL FLUIDS FOR THE FIRST 24 HOURS

Volume and type	Na	Cl
3,000 cc. of 5% D/S.....	462	462
1,000 cc. of M/6 Na lactate.....	167	0
2,000 cc. of 5% D/W.....	0	0
6,000 cc. ....	629	462

This plan could be continued in the second 24 hour period, corrected to the actual small bowel loss during the first 24 hours. Intracellular deficits could gradually be replaced over a period of days.

## CASES

The following are brief case history abstracts of three patients treated at the Royal Victoria Hospital, which illustrate the results of application of the foregoing methods of handling serious fluid and electrolyte problems. Since these were patients on the general services no more than necessary minimum of laboratory determinations were made. All biochemical determinations were made in the medical laboratories of the hospital except the sodium and potassium determinations, which were made in the laboratory of the Department of Experimental Surgery with the aid of the Internal Standard Flame Photometer, previously constructed by one of us (J.R.McC.), and which has a margin of error of less than 1%.

## CASE I

A.R., age 39 years. This man sustained a severe cranio-cerebral injury on October 21, 1950 and was admitted to hospital, where surgical treatment of the compound fractures of the skull and facial bones was carried out after shock was brought under control. After the operation intravenous infusions and gastric tube feedings were given to maintain the patient.

On October 28 it was realized that the patient's condition had deteriorated markedly and a consultation was

held. Space does not permit a detailed account of how replacement therapy was estimated, but the pertinent values are recorded in Fig. 1, in which are shown the serum electrolyte levels, serum non-protein nitrogen levels and their day-to-day changes towards normal during the subsequent course of treatment. Although this patient remained unconscious, owing to the severe

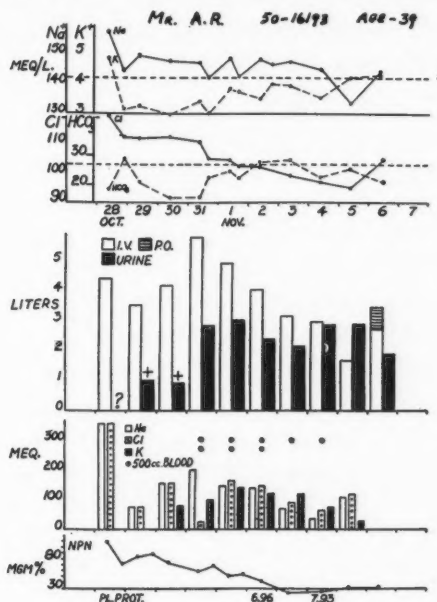


Fig. 1

head injury, fluid and electrolyte balance and nutrition were easily maintained after November 9 by means of gastric tube feedings. He died on January 19, 1951, as a result of brain injury.

This is a case of severe dehydration, with the development of potassium deficiency during the period of rehydration and correction of acid-base imbalance.

#### CASE 2

Mrs. E.E., age 71. This patient underwent a vaginal hysterectomy on October 27, 1950, and during the post-

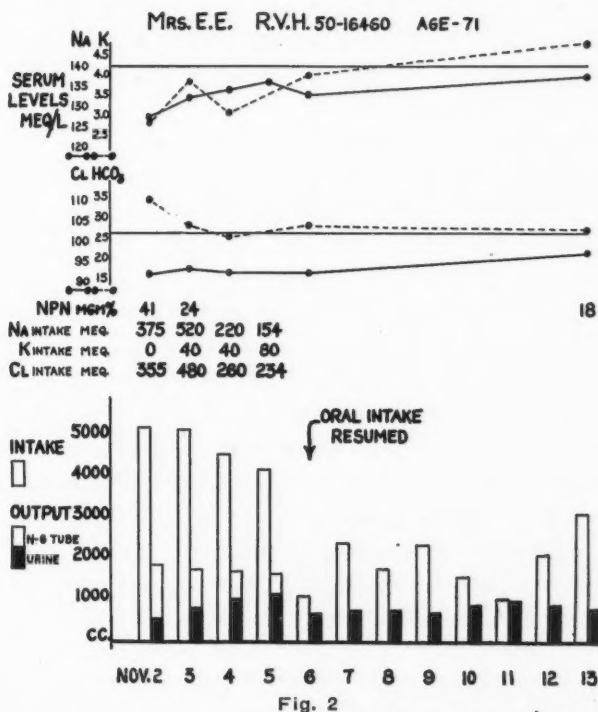


Fig. 2

operative period developed intestinal obstruction and peritonitis, becoming extremely dehydrated. A consultation was held on November 2, and vigorous therapy was begun immediately in an effort to restore fluid and electrolyte balance. It was estimated that there was a deficit of at least 9 litres of body fluid. At that time there were moist râles at both pulmonary bases and

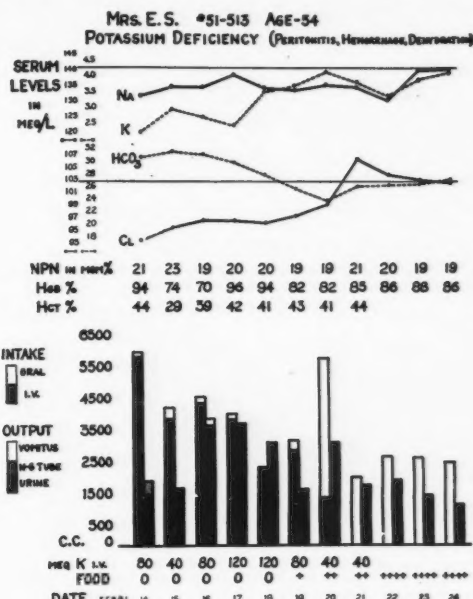


Fig. 3

dependent oedema of the buttocks and thighs.

In Fig. 2 are shown the electrolyte values during therapy as well as the intake and output record. During this period of vigorous therapy the oedema gradually disappeared and the pulmonary râles cleared. Improvement was steady, the bowel obstruction responded to conservative treatment by decompression, and she was well enough for discharge from the hospital on December 11. Since discharge she has carried on with her household duties and is symptom-free.

This is an example of extremely severe dehydration, a "third space" effect (oedema), sodium deficiency, mild hypochloræmic alkalosis and potassium deficiency which responded to appropriate therapy.

TABLE VI (CASE 3)

INTRAVENOUS INTAKES OF ELECTROLYTES							
February.....	14	15	16	17	18	19	20 21
Na.....	550	308	308	308	230	154	154 0
Cl.....	542	348	388	428	350	234	194 40
K.....	80	40	80	120	120	80	40 40

#### CASE 3

Mrs. E.S., age 54 years. This patient was admitted on January 9, 1951, having had a transverse colostomy established 18 months previously for diverticulitis of the pelvic colon. On January 12 the diseased portion of the pelvic colon was resected and end-to-end anastomosis carried out. This was followed by a relatively smooth postoperative course.

On February 6 the colostomy was closed intraperitoneally. Postoperatively the patient had a rather severe hæmorrhage from the intra-abdominal operative site, which was later followed by acute peritonitis with abscess formation. The abscess was drained on February 11, and a faecal fistula developed. Rapid dehydration occurred and developed to a severe degree by February 14. On this day vigorous corrective fluid and electrolyte therapy with laboratory control was instituted.

In Fig. 3 and Table VI are recorded the electrolyte values and the intake and output for each 24-hour period until balance was regained and maintained by the oral route. On February 15 this patient was very weak and had oedema of the lower extremities and over the sacrum ("third space" effect) despite the dehydration then present—probably a manifestation of potassium deficiency and hypochloræmic alkalosis. This cleared rapidly during the next five days. The patient was discharged on March 22 and convalescence was satisfactory.

This is an example of severe dehydration, moderate sodium deficiency, severe potassium deficiency and hypochloræmic alkalosis complicating a postoperative course already complicated by hæmorrhage, peritonitis and paralytic ileus.

These three cases are selected as examples of serious fluid and electrolyte treatment problems. They serve to emphasize the necessity for accurate laboratory control of treatment when profound body fluid and electrolyte imbalances exist. It is our opinion that only by application of the fundamental principles outlined in this paper is it possible successfully to treat such patients by rapid correction of their serious metabolic derangement occasioned by the disease processes or their treatment.

#### REPLACEMENT METHODS

There are several features in connection with replacement methods directed towards accurate fulfillment of the patient's requirements, which must be emphasized:

1. Every effort should be made to administer fluids by mouth in preference to parenteral routes whenever the patient's disorder does not contraindicate the use of the gastro-intestinal tract.<sup>8</sup> There is much less danger of having to meet the consequences of undertreatment or overtreatment when advantage is taken of the dictates of the patient's taste for the various dietary components. When ordinary parenteral fluids are administered alone significant amounts of several electrolytes present in natural foods are not supplied.

2. Day-to-day changes in the weight of the patient are a very useful index of over-all changes in hydration. Although a determined attempt should be made to measure and record accurately the total volumes of both intake and output of everything included in the daily fluid balance, there are often inaccuracies in such measurements. Total insensible loss and perspiration loss can only be estimated rather crudely, and drainage fluids and urine are frequently lost on dressings and in the bed. In the case of a dehydrated patient, progressive gain in weight would indicate a successful effort at rehydration. Conversely, an oedematous patient

should undergo progressive weight loss if the fluid regimen is well designed. Sudden weight changes must be accounted for, and unless other obvious cause exists, diurnal variations in excess of one-half kilogram are usually attributable to loss or retention of body water. Attention may then be directed towards correcting any pathologic alterations by supplying more or less of whatever type of fluid is involved.<sup>8</sup>

3. In the case of the seriously-ill patient, when it is impossible to measure the urine output in the ordinary way, an indwelling catheter should be employed throughout the critical period of the illness, for the hourly urine volume is one of the best indices of the progress of rehydration and the adequacy of fluid therapy. There are very few contraindications to this simple and effective measure.

4. In the case of the seriously-ill patient, again, it is mandatory that an accurate record be obtained, not only of the volume of urine and drainages (*e.g.*, gastric tube suction, sump drain), but also of the composition of these fluids in respect to electrolytes. In the section on dynamic losses, in which tables were given showing the electrolyte content of various types of fluid loss, the extremes of variation were presented in addition to the average values. From a consideration of the variations which may be encountered in a given instance it is self-evident that only by analysis of aliquot samples of these fluids can accurate replacement of each ion, milliequivalent for milliequivalent, be attained. In the absence of adequate laboratory facilities this cannot be so accurately done, and more reliance must then be placed upon clinical judgment and trials of therapy.

5. The final point to emphasize is that, although patients with fluid and electrolyte imbalances fall into general broad categories, it is essential that the surgeon or physician consider each one individually and treat each individually, rather than to use a "rule of thumb" which may further aggravate the existing disorder. In this connection, a carefully taken, detailed history and physical examination coupled with the application of clinical judgment are requisites of the first order which may be supplemented but not displaced by laboratory procedures. It is only in the relatively small group of serious disorders, where clinical judgment (even though astute) cannot be relied upon completely, that laboratory control of therapy assumes such great importance.

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## DERMATOPATHIC LIPOMELANOTIC RETICULAR CELL HYPERPLASIA OF LYMPH NODES

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A NOT GENERALLY RECOGNIZED, but a not uncommon form of dermatopathic lymph node hypertrophy was first described in 1932 by Pautrier and Woringer<sup>1</sup> under the name of lipomelanotic reticulosis. Five years later, in 1937, these French authors, in a more extensive paper<sup>2</sup> reported 11 cases of this particular subcutaneous lymph node enlargement encountered with chronic dermatitis or generalized pruritus. Since 1941, reports on this entity have appeared in the American literature.<sup>3 to 9</sup> All confirmed the original findings of Pautrier and Woringer.<sup>1, 2</sup>

### GENERAL CONSIDERATIONS

The ten cases which form the basis of this report were encountered in the last five years. In five instances the patients presented a generalized exfoliative dermatitis of 14 months' to 9 years' duration. In two cases the exfoliative dermatitis was more localized, involving respectively the lower extremities and the abdomen only. Two patients showed no skin condition, but suffered like the preceding ones from a severe and prolonged pruritus. In one case, there was no skin eruption and practically no pruritus.

The subcutaneous lymph node hypertrophy was widespread in a few patients, but in most it was particularly notable in the axillary and

inguinal regions; occasionally it was predominant in the cervical area. The enlarged lymph nodes were rather firm and not tender, measuring from 10 to 25 mm. On sections of the nodes removed for biopsy, the capsule appeared intact and the parenchyma was soft and often pale yellow; in an occasional node a peripheral area light brown in colour was noticed.

The histologic picture was similar in all cases and very characteristic. The normal architectural pattern of the node was greatly altered, but never completely obscured (Fig. 1). The hypertrophy was due to a hyperplasia of reticular cells with polymorphic nuclei and a rather abundant and faintly eosinophilic staining protoplasm (Fig. 2). These cells had very indefinite

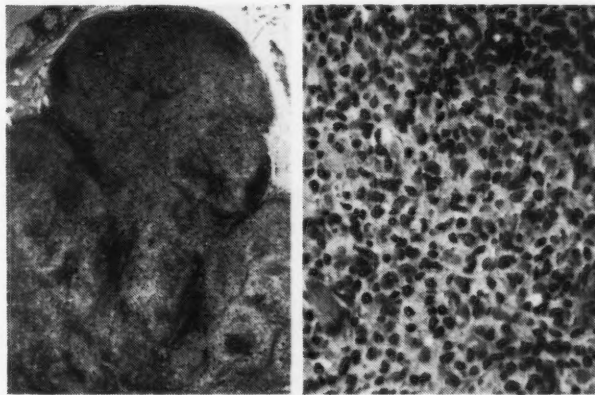


Fig. 1. (Case 1).—Inguinal node. Aspect at low magnification. Hemalum-phyloxin-saffron-x20. Fig. 2. (Case 3).—A focus of hyperplastic reticular cells. Hemalum-phyloxin-saffron-x500.

boundaries and formed homogeneous structures with a patchy distribution throughout the node. In some areas they were grouped in large foci separating and compressing atrophic lymph follicles. Elsewhere they formed strands surrounding the lymph follicles and encroaching on them

or again filling up the pulp sinuses. In spots, a few plasmacytes or an occasional eosinophilic polymorphonuclear were present among these reticular cells, but this was not a conspicuous feature, never being pronounced or extensive.

The most characteristic aspect of these lesions was the phagocytic activity of the reticulum cells, demonstrated by the presence of intraprotoplasmic clear vacuoles and brown pigment. In some nodes the cellular vacuolization was intense, though patchy, and easily noticed under medium magnification (Fig. 3); in others this

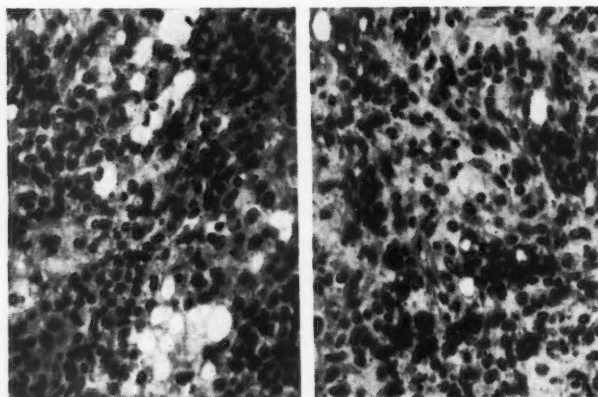


Fig. 3. (Case 5).—An area showing numerous vacuolated reticular cells. Hemalum-phloxin-saffron-x480. Fig. 4. (Case 3).—Reticular cells showing in black intense melanin pigmentation. Fontana ammoniacal silver solution-ponceau B, x 490.

phenomenon was more discrete and seen only in isolated cells. In frozen sections these vacuoles were represented by sudanophilic droplets and undoubtedly of fatty nature. The intraprotoplasmic brown pigment appeared either as a coarse or fine granular substance. This pigment gave all the histochemical reaction of melanin, being bleached by hydrogen peroxide and potassium permanganate and turning black in Fontana's solution, spontaneously reducing the ammoniacal silver nitrate solution (Fig. 4). It was very irregularly distributed and present in cells with or without fat droplets.

#### CASE 1

A man of 35 years was admitted to hospital in June 1948, for a dermatosis of 14 months' duration. The skin condition had started on the dorsal aspect of both hands and had rapidly extended to all the body. The skin was reddish, oedematous and very scaly. Pruritus was generalized and severe. In both axillary and inguinal regions moderately enlarged nodes were present. W.B.C. 13,150 with 18% eosinophils and 5% monocytes.

The tentative clinical diagnosis was generalized exfoliative dermatitis, with possible mycosis fungoides in the erythematous stage.

Skin biopsy (left forearm).—The epidermis shows a moderate acanthosis with an elongation of the rete pegs. The granular layer is absent and there is some degree of spongiosis. In the upper corium, capillaries are slightly distended and surrounded by a few histiocytes and polymorphonuclears, generally eosinophils.

Lymph node biopsy (left groin).—Typical lipomelanotic reticular cell hyperplasia (Fig. 1) with discrete lipidic and melanin infiltration and an occasional focus of plasmacytes and eosinophils.

This patient was seen 1½ years later; the skin had completely cleared and the lymph nodes had disappeared.

#### CASE 2

A young woman of 22 years, hospitalized in March, 1947 for enlargement of the cervical lymph nodes. She complained of generalized pruritus and had noticed 9 days previously the appearance of small fine masses in both sides of her neck.

An x-ray of the chest was normal and the white cell count was 9,000 with 6% monocytes.

Lymph node biopsy (left cervical region). Typical lipomelanotic reticular cell hyperplasia with a moderate quantity of intracellular fat and melanin.

A year and a half later this woman was re-admitted to hospital for appendectomy. No palpable nodes were present and pruritus was absent.

#### CASE 3

A man of 33 years came to hospital in November, 1948 for a generalized skin eruption with severe pruritus of 9 years' duration. The skin was deep red, oedematous and slightly scaly and in some areas showed a brownish pigmentation. A widespread adenopathy was present.

The clinical diagnosis was exfoliative dermatitis and possibly an early stage of a lymphoblastoma. W.B.C.: 12,600 with 7% eosinophils and 3% monocytes.

Skin biopsy (left forearm): the epidermis shows parakeratosis and a slight degree of acanthosis. The granular layer is prominent. The upper corium is oedematous and contains a marked infiltrate of lymphocytes with a few histiocytes. The capillaries and small vessels are dilated. In some areas very finely granular melanin is present.

Lymph nodes biopsy (left groin): typical lipomelanotic reticular cell hyperplasia (Fig. 2) with considerable amounts of lipid droplets and melanin (Fig. 4).

#### CASE 4

A woman of 24 years was hospitalized in September 1949, for an extensive skin eruption with intense pruritus of 16 months' duration. She also complained of crises of vomiting and severe diarrhoea. On examination the skin was generally red and scaly. Enlarged and slightly painful nodes were present in the right subclavicular and the right axillary regions. A moderately large, poorly demarcated and deeply situated mass was palpable in the mid-abdomen. W.B.C.: 15,000 with 1% eosinophils and 5% monocytes.

Skin biopsy (dorsum of left hand): the epidermis is very thin with narrow and widely spaced rete pegs. There are some small areas of parakeratosis. In the upper corium there is a marked dilatation of capillaries. The middle corium is slightly sclerotic with an extremely scarce cellular infiltrate.

Lymph node biopsy (right axilla): typical lipomelanotic reticular cell hyperplasia with moderate fatty infiltration and a small amount of melanin.

At laparotomy, the root of the mesentery was seen to contain a mass of hypertrophic lymph nodes. A biopsy showed the picture of a typical Hodgkin's disease. The patient died two months later and permission for autopsy was not given.

#### CASE 5

A man of 64 years came to hospital in April 1950, with a generalized skin eruption of 18 months' duration. The skin was erythematous and slightly lichenified. Pruritus was extremely severe and in many areas scratch marks were present. There was a widespread adenopathy with somewhat larger nodes in the inguinal region. The clinical diagnosis was simply erythrodermia.

Skin biopsy (right forearm): the epidermis shows a moderate acanthosis with wide and shortened rete pegs. The granular layer is partly effaced and in the Malpighian body and the basal layer there are many hyper-

plastic melanoblasts. The upper corium contains a few cellular foci, made up of polymorphic reticulo-histiocytic cells with an occasional plasmacyte and eosinophil and also a moderate number of scattered melanophores filled with fine granular pigment. W.B.C.: 6,950 with 13% eosinophils and 13% monocytes.

Lymph node biopsy (right inguinal fold): typical lipomelanotic reticular cell hyperplasia with large amounts of pigment and fat (Fig. 3).

#### CASE 6

A woman of 74 years was hospitalized in October 1950, for a tumour of the left inguinal fold and a chronic skin condition of both lower extremities. The tumour consisted in a hard nodular mass of 6 cm., covered by thin reddish skin. It had been removed once 8 years previously and had recurred since. The skin of both legs was erythematous and scaly, with the feature of a chronic exfoliative dermatitis. These lesions were very pruriginous and had persisted over a period of 13 years. The inguinal tumour was removed with a few neighbouring lymph nodes, moderately hypertrophic. W.B.C., 9,800, with 13½ eosinophils and 7% monocytes.

TABLE I.

Case No.	Age	Sex	Lymph node hypertrophy	Skin condition	Pruritus	Duration	Remarks
H.D. 6324	35	M.	Axillary and inguinal	Generalized exfoliative dermatitis	+	14 m.	—
H.D. 2530	22	F.	Cervical	—	+	3 m.	—
H.D. 7349	33	M.	Widespread	Generalized exfoliative dermatitis	+	9 y.	—
H.D. 9758	24	F.	Cervical and axillary	Generalized exfoliative dermatitis	+	16 m.	Hodgkin of abdominal nodes
H.D. 11416	64	M.	Widespread	Generalized exfoliative dermatitis	+	18 m.	—
H.D. 12898	74	F.	Inguinal	Exfoliative dermatitis of lower extremities	+	13 y.	Dermatofibroma protuberans of left groin
I.A.P. 40928	34	M.	Cervical	—	+	2 y.	Hodgkin of mediastinal nodes
I.A.P. 50773	56	M.	Axillary and inguinal	Eczematous dermatitis of abdomen	+	3 m.	—
H.D. 15313	67	F.	Widespread	Generalized exfoliative dermatitis	+	10 y.	Epidermoid carcinoma of abdominal wall, with lymph node metastasis
I.A.P. 54697	7	F.	Right inguinal	—	?	—	—

Inguinal tumour: dermatofibrosarcoma of Darier-Ferrand (dermatofibroma protuberans).

Lymph node biopsy: typical lipomelanotic reticular cell hyperplasia with very abundant granular pigment and fat droplets to a lesser degree.

#### CASE 7

A man of 34 years was admitted to hospital in December 1946, for asthenia, loss of weight and generalized pruritus. On examination a few small round nodes were discovered on the right side of the neck and an x-ray of the chest showed a large mediastinal mass, most probably a lymphoblastoma. W.B.C.: 9,200 with 2% eosinophils and 10% monocytes.

Cervical lymph node biopsy: Typical lipomelanotic reticular cell hyperplasia. Melanin and large fat droplets in very large amounts.

Urine was examined at intervals for the presence of melanin and traces of this substance were found in two instances.

After roentgentherapy on the mediastinum the patient was discharged. He returned to hospital a few months later and died 2 years after the onset of symptoms. At autopsy the diagnosis was Hodgkin's disease of the mediastinal lymph nodes.

#### CASE 8

A man of 56 years was hospitalized in April 1949, for a pruriginous skin eruption of 3 months' duration with enlargement of the axillary and inguinal lymph nodes. The skin lesions involved principally the abdomen and had eczematous features. The hypertrophic nodes were firm, round, not tender and the size of walnuts. The patient had lost 25 lb. in the last year and a half.

Inguinal lymph node biopsy: typical lipomelanotic reticular cell hyperplasia with a large quantity of pigment and fatty infiltration.

#### CASE 9

A woman of 67 years was admitted to hospital in June 1951, for a cutaneous tumour of the right paraumbilical region. This tumour had appeared in the last year and formed a fungating mass of 6 x 5 cm. in diameter. Since ten years this patient had suffered from an erythematous and scaly skin condition. The lesions appeared first on the forearms and had progressively covered all the body, leaving only here and there a few clear areas. Pruritus was persistent and severe. There was a widespread

lymph node hypertrophy, but in the right axilla and right groin much larger nodes were noted. W.B.C.: 7,300 with 4% eosinophils and 6% monocytes.

Abdominal tumour (surgical specimen): epidermoid carcinoma (Grade 2).

Skin biopsy (abdominal wall): there is a rather pronounced acanthosis of the epidermis with widened rete pegs and absence of the granular layer. Some parakeratosis is present with a few foci of polymorphonuclears. The upper corium contains isolated foci of lymphohistiocytic cells.

Right axillary lymph nodes: seven nodes were examined. One contained a metastatic nodule of an epidermoid carcinoma. The six others showed a typical lipomelanotic reticular cell hyperplasia.

Right inguinal lymph nodes: seven nodes were also examined. One was completely destroyed by an epidermoid carcinoma and in the others a typical lipomelanotic reticular cell hyperplasia was present.

#### CASE 10

A country girl of 10 years was brought in in March 1951, because her mother had noticed small nodular masses in the right inguinal area. On examination six firm,

round nodes of approximately 6 to 10 mm. were present in this region. There was no history of dermatosis and no important pruritus.

The removed nodes showed a moderate lymphocytic and reticulo-endothelial hyperplasia with a normal architectural pattern, except here and there where this was disturbed by areas typical of lipomelanotic reticular cell hyperplasia. In these areas intracellular fat was abundant and there was a small amount of melanin.

#### COMMENTS

The histologic picture of lipomelanotic reticular cell hyperplasia of lymph nodes is very characteristic and cannot easily be mistaken for Hodgkin's disease as any other lymphoblastoma. It is important to note, however, that to make this diagnosis on a subcutaneous node does not of necessity preclude the existence of a lymphoblastoma. This is well demonstrated by two of our cases (cases 4 and 7) where deeper nodes were the seat of Hodgkin's disease.

In seven of the ten cases reported here there was a chronic dermatosis, but in no case was the clinical dermatologic diagnosis very clear cut. When skin biopsies were done the pathologic changes varied tremendously and were not typical of any particular dermatosis. For instance if the general picture was that of lichen planus, neurodermatitis or psoriasis, many important characters were missing and a precise histologic diagnosis could not be made. In the reports of the literature this difficulty in the dermatologic diagnosis is often emphasized and some authors<sup>5 to 7</sup> consider it an integral part of this particular clinico-pathologic entity. It is doubtful if this be true. In cases of chronic erythematous dermatosis, lymph node biopsies are apt to be done only when the lymph node enlargement is sufficient to suggest a tentative clinical diagnosis of Hodgkin's leukæmia, mycosis fungoides or some other lymphoblastoma. It is not a regular procedure, at least not in our clinics, to perform lymph node biopsies in all cases of chronic skin lesions, especially when they are of a known origin. Pautrier and Woringer, who first described this particular lymphadenopathy, encountered it at first in patients where the dermatologic diagnosis was in doubt.<sup>1</sup> Later they examined subcutaneous lymph nodes in cases for example of mycosis fungoides at the erythematous stage, of Hebra's prurigo ferox and arsenical dermatitis, and found a similar and characteristic histologic picture.<sup>2</sup> It becomes evident, on the other hand, that even if the histologic picture of lipomelanotic reticular cell hyperplasia is characteristic,

the etiologic diagnosis of any chronic dermatosis is not at all clarified by the lymph node findings.

Severe pruritus seems to be the most important factor in the pathogenesis of these lymph node lesions. In nearly all the cases recorded here severe pruritus was present, even when there was no skin condition. The scratching and injury induced by pruritus most probably explains why excessive amounts of melanin and fat enter the subcutaneous lymph vessels, are then transported to regional lymph nodes and there phagocytosed by reticular cells. The quantity of these materials in the nodes is most likely dependent on the duration, the extent and the severity of the pruritus. The existence of a lipomelanotic reticular cell hyperplasia of the inguinal lymph nodes in our last case remains, however, unexplained.

#### SUMMARY

Ten cases of dermatopathic lipomelanotic reticular cell hyperplasia of lymph nodes have been reported. Chronic dermatosis was present in 7 cases and severe pruritus in 9. This somewhat cumbersome name is preferred to "lipomelanotic reticulosis" as proposed by Pautrier and Woringer.<sup>1, 2</sup> It seems best to keep the term reticulosis for systemic and generalized hyperplastic diseases of the reticulo-endothelial system. The name "dermatopathic lymphadenitis" given to this entity by Hurwitt<sup>4</sup> is misleading, because strictly speaking, there is no adenitis.

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ADENOMA OF THE ISLANDS OF LANGERHANS.—While spontaneous hypoglycæmia is readily recognized it is often difficult to distinguish between functional and organic varieties. The symptoms are probably all due to abnormalities in the autonomic and central nervous systems and to an increased secretion of epinephrine. Progressive symptoms and a blood sugar level below 50 mgm. after prolonged fasting favour a diagnosis of tumour of the islet cells. Glucose tolerance tests may prove misleading in differential diagnosis. In doubtful cases failure to respond to a high-protein, low-carbohydrate diet is an indication for surgical exploration.—Perkins, H. A., Desforges, J. F. and Guttas, C. G.: *New England J. Med.*, 243: 281, 1950.

## THE ACUTE TRAUMATIC CHEST

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THE TWO WORLD WARS have contributed greatly to our management and understanding of chest injuries. The mortality was reduced from approximately 25% in World War 1 to about 6% in the last conflict. This improvement resulted, in a great part, from a better understanding of respiratory physiology and the application of this knowledge to the actual treatment. Obviously, improved anæsthetic technique and chemotherapeutic advances have played an important rôle in these encouraging figures.

Injuries to the chest can be divided into two groups: those which penetrate the chest wall and thus cause in many instances injury to the intrathoracic structures, and those which contuse or lacerate the chest wall but do not enter the pleural cavity. In the first group blood vessels, especially the intercostals, and internal mammary, may be torn with the resulting hæmothorax. Injuries to the bony thorax may drive pieces of bone or clothing into the lung, lacerating its substance and often carrying in infection. Laceration of the lung leads to coughing up of blood and to the escape of air into the pleural space. Persistent hæmorrhage (as a rule from the chest wall) and tension pneumothorax are the two paramount thoracic emergencies, immediate relief of which is a matter of life or death. To these must be added the open chest wound, and the "stove in" chest.

The simplest injury to the chest is a fractured rib, and such damage is often looked upon as being relatively unimportant. If a simple fracture occurs in an obese person, or one who has a pre-existing bronchiectasis, or in an old person, it can result in serious difficulties. These fractures, because the parietal pleura and rib periosteum are liberally supplied with sensory nerves, will give rise to considerable pain. This will hamper the individual's normal respiratory exchange, and will make cough a distasteful act. The resulting anoxia, from the accumulated secretions in the bronchial tree, still further increases the volume of fluid by causing vessel permeability.

A review of the literature shows a mortality of 5 to 9% in patients with multiple fractures and a complication rate of 13% for all rib frac-

tures, single or multiple. Mortality rates as high as 10.4% have been reported.

Direct force produces a fracture of the rib at the site of violence. Indirect force may lead to fracture of the rib distant from the site of impact and the rib gives way at the point of maximum convexity, usually near its angle. Both forces may operate to produce multiple fractures of a single rib or ribs, resulting in the "stove-in" chest.

Incomplete fractures, and complete fractures, unattended by rupture of the periosteum, seldom show either displacement or injury to the pleura or lung. Displacement of fracture fragments depends primarily upon the acting force. Overlapping of fragments is common in fractures involving multiple ribs.

Injury to the lung is a common result of fracture of the ribs. A contused wound may show only minimal hæmorrhage in the lung adjacent to the fracture site, but in severe trauma to the chest, associated with multiple fractures, an entire lobe may show hæmorrhagic consolidation. The lungs, heart, or abdominal viscera, may suffer extensive laceration by an in-driven rib fragment, which recoils to its normal position, and the x-ray may be misleading. The parietal pleura always shows extensive laceration in displaced fractured ribs. The visceral pleura is often torn by the serrated edge of the inwardly displaced fracture fragment which usually lies within the pleural cavity. Pneumothorax is a frequent result. Air escapes into the thoracic wall by way of the defect in the parietal pleura leading to subcutaneous emphysema and occasionally mediastinal emphysema. Emphysema is conclusive evidence of lung injury. Fractured ribs with displacement are usually accompanied by some degree of intrapleural hæmorrhage. Laceration of major branches of the pulmonary artery and incomplete lacerations of intercostal arteries are likely to lead to continued bleeding into the pleural cavity.

It was learned in the last war that an individual who receives a contusing or penetrating wound of the chest, often develops in a period of hours, an extensive bilateral pulmonary oedema. Experimental and clinical observation shows that trauma to the chest wall produces bronchospasm and increased bronchial pulmonary secretion. The increased pulmonary secretions, the presence of blood in the bron-

chial tree, bronchospasm, and an ineffectual cough leads to bronchial obstruction and the development of atelectasis. If this complication is not recognized and treated it may terminate in traumatic pneumonia.

The preservation of negative intrathoracic pressure is dependent on the integrity of the chest wall. In severe crushing wounds of the thorax (the "stove-in" chest) the support of the ribs is lost. A large segment of the chest wall is depressed during inspiration and forced outwards during expiration, resulting in paradoxical respiration. With each inspiration part of the de-oxygenated air from the injured side is forced into the sound side. During expiration, this vitiated air is forced back into the injured side, hence normal oxygen exchange is embarrassed, with consequent anoxia and cyanosis.

A normal negative intrathoracic pressure cannot be maintained. Mediastinal flutter resulting, leads to inadequate cardiac filling and a picture of shock. Positive pressure hæmothorax, pneumothorax, and compression of the heart by intrapericardial hæmorrhage may act in a similar manner.

Fractures of the sternum usually result from automobile accidents, the so-called steering-wheel injury. It is most frequently a transverse fracture in the upper third of the sternum, the upper fragment lying behind the lower. Dyspnoea and cyanosis from vessel and tracheal compression are present if the misplacement is sufficiently marked. Mediastinal emphysema, pneumothorax and hæmorrhage must be kept in mind.

Rupture of the diaphragm is a relatively uncommon injury which is easily overlooked. The diagnosis, though not difficult, is usually delayed. Barium studies easily disclose a hernia which is almost always on the left side.

#### TREATMENT

The effect of rib fractures upon the oxygen supply to the individual is probably in direct proportion to the associated pain, which causes splinting of the thorax and a decreased respiratory movement. The older methods of controlling thoracic wall pain have been adhesive strapping and the generous use of morphine. Both are physiologically unsound approaches, ineffectual and dangerous. Morphine diminishes the all important cough reflex. When adhesive strapping is used any existing anoxia is further increased by limitation of the chest wall motion;

in addition, it handicaps the propulsive mechanism of the cough reflex.

The logical therapy is the abolition of pain and the physiologic remobilization of the chest wall. The blocking out of pain stimuli by procaine injections either at the site of injury, by intercostal nerve injections or by thoracic paravertebral block, produces immediate and often dramatic results. The cough becomes painless and effective, the evacuation of the bronchopulmonary tree becomes established. It also improves broncho-pulmonary drainage by apparently abolishing the reflex mechanism responsible for bronchospasm and increased secretion. Repeated injections are usually necessary.

However, paradoxical respiration due to the flail chest, demands rib immobilization. This is achieved by fixing the loose fragment with adhesive strapping applied over a pad of wool. Sandbags may also be used. When the sternum is the mobile fragment it is immobilized by means of a cervical tenaculum, introduced into the intercostal spaces, obtaining a good grip of the sternum. One or more instruments are introduced and with five pound traction from an overhead beam the movement is materially lessened.

In multiple rib fractures it is essential to diagnose accurately the pathologic conditions present and to recognize its effect on the cardio-respiratory mechanism. Cyanosis, hypotension, and respiratory difficulties may frequently be relieved by aspirating blood and mucus from the tracheo-bronchial tree with a catheter. The technique of catheter suction is simple and can be repeated at frequent intervals without danger or trauma. In certain cases where more efficient aspiration is needed, bronchoscopy is resorted to, particularly where there is obstruction and atelectasis due to blood clots and thick mucous plugs.

One of the major surgical advances of the last war was the treatment of hæmothorax based on a sounder pathological knowledge. Blood usually clots rapidly as it goes into the pleural cavity. The motion of the heart, lungs and diaphragm defibrinates the blood, leaving serum and cells. The fibrin is deposited on the visceral and parietal pleura. The so-called secondary clotting takes place when, due to reaction of the blood in the pleural cavity, a pleural exudate is thrown out. This supplies further fibrinogen for the deposition of further fibrin on the pleura. This process is speeded up by infection. Within

four weeks adult fibrosis tissue is formed and subsequent angioblastic proliferation makes decortication difficult. Without treatment the process goes on to fibrothorax, emphysema and reduced pulmonary function.

The early and complete removal of blood and air by repeated and thorough thoracentesis is absolutely necessary to produce a fully expanded and functioning lung. A fair proportion of cases can be cured by this method. If aspiration becomes unsuccessful due to blood clotting, early evacuation of the blood clots by thoracotomy as soon as the patient can withstand this procedure is highly desirable. The organized hæmothorax must be treated by a formal decortication, preferably in the third or fourth week, to prevent a pulmonary invalid.

The discovery by Tillett and Sherry that rapid lysis of blood clot and related coagulum of exudates takes place when concentrated and purified preparations, derived from broth cultures of hæmolytic streptococcus, were instilled into them, will probably change our treatment in the future. The initial results have been very promising.

When trauma to the chest has resulted in injury to the lung, air often escapes into the pleural space. This produces mediastinal and cardiac tamponade. If a tension pneumothorax results, one lung is collapsed and the opposite lung is compressed by the displaced mediastinum. Early treatment is imperative to relieve the embarrassed cardio respiratory system and diminish shock. Such patients are best treated by the introduction of a small urethral catheter or a special needle into the pleural spaces, which is attached to an under water seal. The lung rapidly expands. Do not remove the catheter too soon, until pleural symphysis has taken place.

Emphysema requires very little in the way of treatment even when severe. It is seldom a serious complication, although often a distressing one. It does relatively little good to open the fascial planes except in those instances in which the mediastinal spaces are involved. Here a collar incision is used. The administration of 100% O<sub>2</sub> replaces the nitrogen content of the air contained in the tissues, and is rapidly absorbed by the bloodstream.

Failure to diagnose cardiac tamponade often results from too much dependence on x-ray examination. Only examinations with the fluoroscope will establish the excursions of the heart.

Aspiration through the upper abdominal wall at the junction of the left costochondrium with the left side of the xiphoid process is the route of choice, as it is attended with less accidents and dependent drainage is assured.

The sucking chest wound indicates a connection between the pleural cavity and the external atmosphere. Early establishment of an intact thoracic cage is a basic necessity in restoring normal respiratory physiology. Emergency treatment can be accomplished by a simple occlusive dressing, to be followed by indicated surgical repair.

In conclusion I would like to stress particularly the extreme importance of physiotherapy in all these cases. From the beginning, the patient must be encouraged to keep his tracheo-bronchial tree clean by regular coughing, breathing exercises, and posture if possible. Rigid supervision is usually necessary and a trained physiotherapist in attendance is most valuable. The physiotherapy must be continued into the convalescent and rehabilitation period, in order to restore the cardio-respiratory system to normal. Adequate physiotherapy is a most important factor in reducing the mortality and morbidity of chest trauma.

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#### AN ELECTRICAL ARTIFICIAL PACEMAKER FOR STANDSTILL OF THE HEART

Using animals at both normal and low temperature, resuscitation of cardiac standstill was achieved by an electrical stimulator. The sinoauricular node was the site to which the electrode was applied, sometimes by venous catheterization, sometimes by an operation to expose the node externally. Experimental cardiac arrest by vagus stimulation is believed to most closely duplicate that encountered in the operating room and effective expulsive heart beats were produced at any desired rate by the methods described. It seemed safe and free from complications.—Callaghan, J. C. and Bigelow, W. G.: *Ann. Surg.*, 134: 8, 1951.

## SARCOMA OF THE STOMACH\*

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THE IMPORTANCE and frequency of gastric cancer is common knowledge to every surgeon. Though an overwhelming majority of cancers of the stomach are carcinomas, the non-epithelial group of gastric malignant tumours is gaining in importance, as shown by the many reports in the medical literature in recent years.

Many reasons have awakened a new interest in this group of tumours. The multiplication of case reports has permitted comparisons and evaluations of the chief symptoms and of methods of diagnosis and treatment. The number of 5 year survivals is increasing and is a stimulation to further study.

In this paper, the clinical cases of sarcoma of the stomach seen in the Hôtel-Dieu Hospital from January 1945 to July 1951 are presented. Analogies and differences from what is already known are discussed, followed by considerations of the etiological problems.

## PART I.—CLINICAL MATERIAL

*Incidence.*—From January 1, 1945, to June 30, 1951, 363 cases of malignant tumours of the stomach have been diagnosed at l'Hôtel-Dieu de Québec Hospital. Of these, 357 were carcinomas, and 6 were sarcomas—a ratio of 1.68%. Of our 6 patients, 4 were males. The ages ran from 45 to 68 years, with an average of 56.

*Symptoms.*—The case histories will not be detailed, but only the prevalent symptoms indicated: (a) The time of illness prior to the first consultation was carefully checked. The shortest length of time between the appearance of symptoms and consultation was 4 months, and the longest 1 year, with an average of 6.5 months. (b) The chief complaint of all our patients at their admission at the Hospital was pain, epigastric pain, with no special character, no timing. (c) Hæmorrhage was the second major symptom noticed: 4 had easily noticeable hæmorrhage; of these, 2 were hæmatemesis, 2 were melena. (d) At the abdominal examination, a tumour, localized in the epigastrium, could be palpated in 4 patients.

*Radiologic findings.*—The x-ray films of the stomach showed in 5 instances a large tumour. Three were on the middle part of the small

curvature. Two consisted of a tubular narrowing of the middle part of the stomach. In the other case the film was classified as normal, but the operation revealed the tumour to be localized on the anterior wall of the stomach. This patient had a serious hæmatemesis.

*Diagnosis.*—In no instance was a clinical diagnosis of sarcoma of the stomach made. In 5 patients, the tumour was believed to be a carcinoma, and in these patients with a palpable tumour, the question of their operability had been evaluated with doubt. In the other case, which could not be diagnosed by radiology, it was believed to be an ulcer.

*Treatment.*—Of our 6 patients, 5 had an exploratory laparotomy. The other case was diagnosed by an axillary lymph node biopsy and an x-ray, which showed a large tumour of the middle part of the stomach, giving a tubular narrowing of the viscus.

Of the 5 patients who were operated on: 3 had a partial subtotal gastric resection with Polya type of gastro-jejunal anastomosis; in 1, a total resection of the stomach, with an endo-thoracic œsophago-jejunostomy was done. The other had an involvement of all the upper part of the abdomen and only a biopsy specimen was taken.

Deep radiotherapy was administered post-operatively to three patients.

*Pathology.*—Macroscopic specimens were as follows: 3 large ulcerated tumours, having a disc-like shape, involving the middle part of the stomach; 1 infiltrating type of tumour progressing between the layers of the stomach.

It is perhaps important to examine more closely this disc-like shape of tumour, assumed by the lympho-sarcoma of the stomach. It is a combination of infiltration of layers superficially and growth into the gastric lumen, with subsequent necrosis of the middle or thickest part of the neoplasm. It appeared in our series in 3 cases, and it is suggested that it might be a type of growth particularly frequent in lympho-sarcomas.

*Microscopically*, the tumours can be classified in this way: True lympho-sarcoma, 1 case. Lymphoblasto-sarcoma, 2 cases. Reticulum cell sarcoma, 3 cases.

The true lympho-sarcoma is the small round cell sarcoma, arising from the lymphocytes, as classified by Warren and Lulenski,<sup>36</sup> and by Madding.<sup>18</sup>

\*Paper presented at the meeting of the Royal College of Surgeons of Canada, September 28 and 29, 1951.

The lymphoblasto-sarcoma has large cells, larger than the lymphocytes, with irregular and large nuclei and few mitotic figures. It originates from the lymphoblast. This is in accordance with Gall and Mallory's<sup>7</sup> classification of malignant lymphomas and is the equivalent of their lymphoblastic lymphoma.

The reticulum cell sarcoma originates from the cell of the reticulum. It has large cells with pseudopod like processes of the protoplasm, large nuclei and many mitotic figures.

#### RESULTS

Case 1 underwent a subtotal gastric resection followed by deep x-ray therapy. The patient is well after 65 months.

Case 5 had a subtotal gastric resection, followed also by radiotherapy. The patient is well after 27 months.

Case 2: Subtotal resection—no radiotherapy. This patient had liver metastases at the time of the operation. He died after 5½ months.

Case 6: This patient had a total gastrectomy with œsophago-jejunostomy, followed by radiotherapy, but he died 3 months later probably of a recurrence of his disease.

Cases 3 and 4 did not have any radical treatments because they were already at the last stage of their disease.

#### PART II.

If one compares these data with the different publications of the last few years, it is interesting to note that our cases do not differ much. In 1940, Ewing stated the incidence of sarcoma to be around 1% of all gastric cancers, but subsequently higher figures were found, for example, by Marshall<sup>20</sup> in 1950: 3.5%. As for age, most authors agree that sarcoma of the stomach is prevalent among a younger age group of patients than is carcinoma. In our series, however, the average age is 56, a figure which is somewhat higher than the findings of others. There is no explanation of this.

*Symptoms.*—The clinical symptoms should be studied carefully because here resides the possibility of arriving at a diagnosis of sarcoma of the stomach before the operation.

This possibility is denied by many<sup>25, 27, 31</sup> on the basis that no one symptom is characteristic of the disease, and different from those of carcinoma. But, as more cases were accumulated, it became obvious that the clinical picture had a

certain pattern, with the following prevalent symptoms: (1) Epigastric pain is almost always the major complaint; (2) Melena is cited often; hæmatemesis very rarely, although we had 2 cases; (3) Conservation of a good general condition is noteworthy. There is no vomiting, no obstruction: the tumour is localized away from the gastric orifices. (4) Palpation of an abdominal tumour should not be interpreted as a criterion of inoperability, as is the case of most carcinomas. On the contrary, it should incite the surgeon to scrutinize the case more thoroughly. In case 2 of our series, a large epigastric mass was palpable, and the patient is still alive and well after 27 months.

In the opinion of those who are in a position to see a large number of such patients, more emphasis should also be placed on the usual methods of diagnosis such as radiology and gastroscopy.

*Treatment.*—The treatment is surgical, but the lympho-sarcoma group of tumours are radio-sensitive and deep x-ray therapy is indicated in the postoperative period. Sometimes it might be the only possible method of treatment, and should not be neglected because cases treated that way are known to have survived 5 years or more.<sup>37</sup>

This combination of radical surgery and radiotherapy has given surprisingly good results, results far superior than those reported for carcinoma of the stomach. Could these results be a partial answer to some of the etiological problems that surgeons and pathologists have been asking themselves for so many years?

Drs. Pack and McNeer,<sup>24</sup> in 1935, recall Ewing's opinion that "lympho-sarcoma may begin as an inflammatory process", particularly in the case of gastric lympho-sarcoma; and also that the following questions must be answered: "Is it part of a leukæmic process? Is it part of a gastro-intestinal pseudo-leukæmia? Is it part of a generalized lympho-sarcoma? Or is it solely a localized tumour?"

Lovin,<sup>17</sup> in 1919, considered surgery as an irrational treatment, because he believed lympho-sarcoma to be a systemic disease, involving the whole lymphoid tissue at the same time. On the other hand, surgeons continued doing gastrectomies for lympho-sarcoma for the sole reason that the tumours could not be diagnosed in the operating room and were resected as carcinomas. This was fortunate, because it became

obvious that the surgical treatment was good and long survivals frequent.

Conclusions were then drawn that lympho-sarcoma was, at least in some cases, a localized tumour, which could be completely cured if eradicated before the spreading of metastases. This view seems logical in fact, on account of the many survivals now reported.

But the study of lymphoid tumours leads into many trails, which render a definite conclusion difficult. Unusual cases are reported here and there. For example, Dixon<sup>4</sup> recalls the history of a patient operated upon in 1917 for a lympho-sarcoma of the stomach. The patient was well for 25 years and came back in 1942 with an inoperable lympho-sarcoma of the stomach. Was

The examination of the microscopic slides permits us to see that the two tumours are not exactly the same. The tumour of the pharynx is of the lymphoblastic variety, with large cells, irregular and large nuclei, and mitotic figures (Fig. 1), whereas, the gastric tumour can be classified in the lympho-sarcoma subgroup. The cells are round and small (Fig. 2).

The difference in type of the 2 tumours would be in favour of the hypothesis that these are 2 primary growths, their growth being made possible by a factor already present in the tissues or fluids of the patient. What is more, at the time of the gastric resection, a lymph node of the omentum was found to have a peculiar appearance. Macroscopically this node was believed

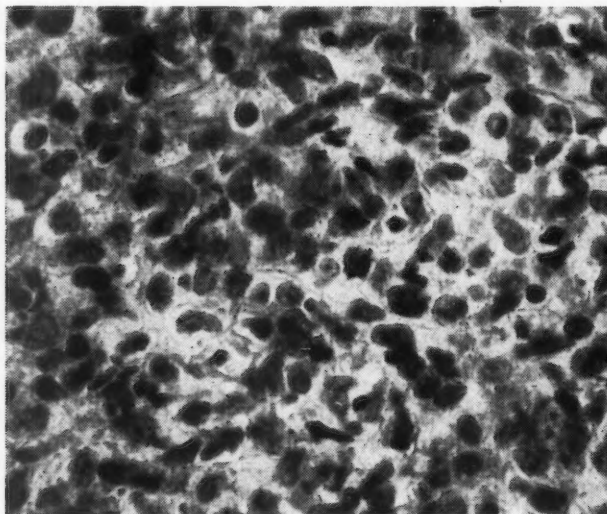


Fig. 1

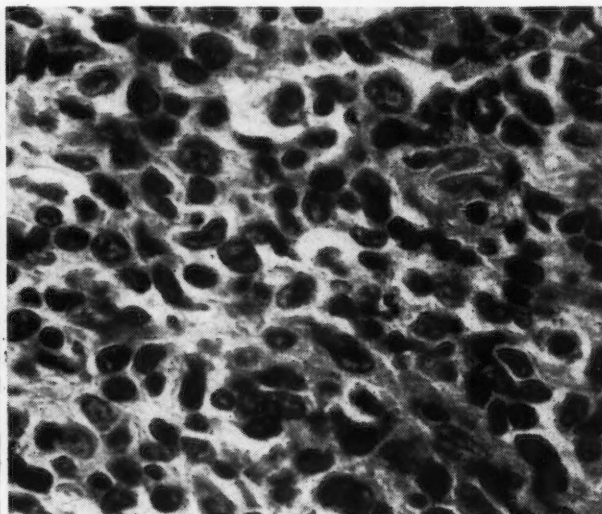


Fig. 2

Fig. 1. (X-840).—Lymphoblastosarcoma of the upper pharynx. Fig. 2. (X-840).—Lympho-sarcoma of the stomach in the same patient, two years later.

it a new growth or a metastasis of the first primary? Or was there any other factor, making possible the development of the two cancers.

Case 5 of our series, a patient operated in 1949 for a lympho-sarcoma of the stomach and now living and well after 28 months, as recorded previously, has indeed an interesting history.

In 1947, 2 years before the gastric tumour episode, the patient, a white female, 67 years old, came to the hospital complaining of obstruction of her left nostril, with bloody discharge. The physical examination revealed a proliferating tumour of the upper pharynx. The biopsy report: lymphoblasto-sarcoma of the large cell type.

Deep x-ray therapy was given by 2 portals and the tumour melted rapidly. The patient remained well for 2 years until she complained of gastric troubles—as we know. Again, was it a new growth or a metastasis?

to have been invaded by a metastasis, but the histologic section showed a modification of the normal pattern in the way of a follicular lymphoma of Brill-Symmers. How could this modification be interpreted?

Could the same cause responsible for the two primaries, produce also a follicular lymphoma type of reaction? Then could the follicular lymphoma be the first step to lympho-sarcoma?

There is also another type of lymphoid tumour of the stomach that should be mentioned. In 1937, Gosset, Guttman and Bertrand,<sup>8</sup> of Paris, described what they called "lymphoblastosis of the stomach" and classified this condition as a malignant lymphoid process belonging to the lympho-sarcoma group. Bertrand,<sup>3</sup> in 1951, emphasizes the importance of the disease. It is an infiltration of the mucosa of the stomach by lymphoid cells, with destruction of all glandular

formation and invasion of the muscularis mucosæ. The infiltrating cells are large, with irregular nuclei and of the lymphoblast type.

These authors believe this neoplasm to be a first link in the development of lympho-sarcoma. The clinical signs are very minimal and may only consist of gastric discomfort or some radiologic zones of rigidity of the gastric walls. In the operating room, the surgeon may not be able to detect the pathologic condition by inspection and palpation. Yarnis and Colp<sup>37</sup> and Thompson<sup>35</sup> express the same opinion and advise gastric resection in these cases, even though there is no actual tumour.

Is gastric lymphoblastosis another form of reaction of the gastric lymphoid tissue to the same causative factor that can produce lympho-sarcoma? Symmers,<sup>34</sup> in 1944, studied the deeper anatomic changes in lymphoid diseases and found that for all lymphoid diseases the distribution of lesions predominated in the digestive tract and in the thoracic and abdominal lymph nodes. And in conclusion, he expressed the opinion that there might be a causative agent invading the organism through the mucous membranes.

Finally, Sakamoto<sup>30</sup> succeeded in producing reticulo sarcoma in the fowl from cell-free filtrate of human reticulum cell sarcoma. The pathological conditions produced were not always the same: in some cases reticulum cell sarcomas were obtained, in others, some form of reticulosis.

Is any comparison possible with the human different modifications of the lymphoid tissue? Are these different modifications caused by the

same factor? Is gastric lympho-sarcoma a systemic disease with some localization or a localized tumour?

In practice, for the surgeon it is still a localized tumour.

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## PHARYNGO-CESOPHAGEAL DIVERTICULA

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DIVERTICULA at the pharyngo-oesophageal junction are not common. Wheeler<sup>1</sup> reports 0.11% in 20,000 routine barium examinations. They occur, however, with sufficient frequency that surgeons should be familiar with the diagnosis and treatment. Considerable literature has been written about the comparative anatomy, evolution and causes by Negus,<sup>2</sup> Harrington,<sup>3</sup> etc.

This paper is limited to the clinical picture presented, the radiological findings and the treatment. A one-stage operation, as described by

Sweet,<sup>4</sup> will be discussed. The relative merits of the two-stage or one-stage procedures are not discussed. Suffice it to say that a one-stage operation is preferable in any condition if its safety can be assured.

#### SYMPTOMS

The outstanding symptom, of course, is difficulty in swallowing, first of solid foods and then of liquids. Contents of the diverticulum may regurgitate into the pharynx at any time during the day or night, and cause most distressing spells of choking and coughing.

One patient in this series practically became a recluse. He took his meals alone because he was

embarrassed by the antics he must perform in order to swallow food, and he could not visit friends or attend church or theatres because of unexpected attacks of choking and coughing. Loss of weight had been extreme. Another explained that he could get his food down quite well if he was in a place where he could "work his head like a duck". Other symptoms, such as splashing or gurgling sounds in the neck, may be described.

#### RADIOLOGICAL DIAGNOSIS

Any patient who complains of dysphagia should be given a barium swallow.

1. *Preparation.* It is preferable to examine the patient in the fasting state so that the diverticulum will not have been recently filled with food or fluid, but this is not absolutely necessary.

2. Fluoroscopic examination should be carried out in the upright position first. Since the diverticulum arises from the posterior aspect of the pharyngo-oesophageal junction, the patient should be examined in the lateral projection, particularly if the diverticulum is small.

3. The usual barium cream preparation used for gastro-intestinal x-ray is quite adequate in most cases. If the diverticulum is very small and does not tend to remain filled for adequate filming, thick barium paste is given so that it will retain barium while films are being obtained.

4. The relationship of the diverticulum to the oesophagus is later shown on films when made with the patient in a prone oblique position. It is difficult to get films in the upright position which show the main lumen of the upper oesophagus filled, as the barium normally passes through this area very rapidly.

#### PREOPERATIVE PREPARATION

If the patient is emaciated and dehydrated, it is probable that the protein metabolism is disturbed. Intravenous therapy, blood transfusions, and, if necessary, feeding through a Levin tube should be used until it is felt that the patient is a good surgical risk. Antibiotics should be given during the two or three days prior to operation. The combination of careful preparation, the use of antibiotics and meticulous surgical technique will insure the safety of the one-stage operation.

#### OPERATIVE TECHNIQUE

Fig. 1 reminds us of Negus' conception of the location and development of a diverticulum.

The technique as described by Sweet<sup>5</sup> has been used in all cases. A skin incision is made parallel to the anterior margin of the left sternomastoid muscle (Fig. 2). The platysma is divided parallel to the skin incision. The omohyoid muscle is exposed and retracted downwards. The sternomastoid muscle is retracted laterally. The sternohyoid muscle and thyroid gland are retracted medially. The inferior

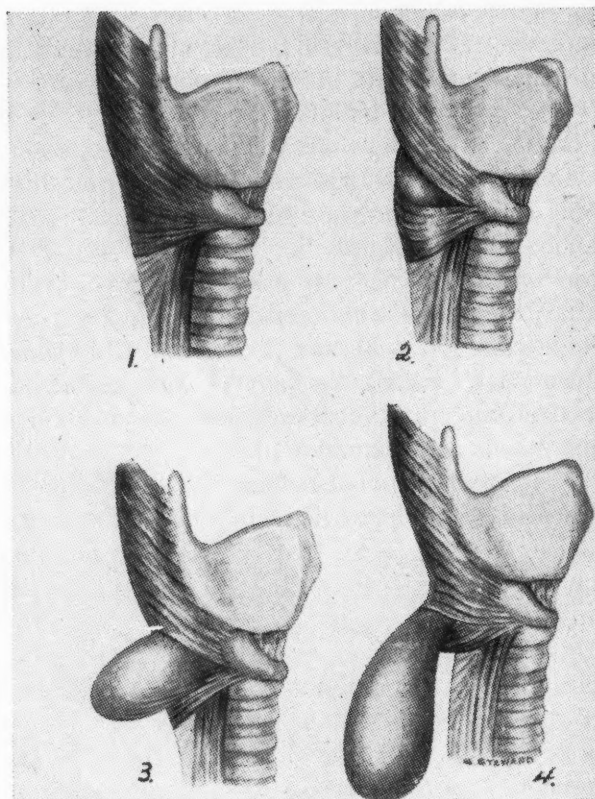


Fig. 1.—Pharyngeal diverticula. (1) Normal musculature of hypopharynx, showing the arrangement of inferior constrictor muscle. (2) Separation of circular and oblique divisions of the inferior constrictor (Professor Parson's specimen, R.C.S., Eng.). (3) Small pouch (Mr. Colledge's specimen in Museum, R.C.S., Eng.). (4) Large pouch (R.C.S. Museum).

thyroid vessels are exposed and retracted downward or divided. The carotid sheath is exposed and retracted laterally. Nothing but areolar tissue remains, and may be cleared from the diverticulum by blunt dissection. The diverticulum is easily located without the assistance of a bougie or other instrument inside it. It is drawn gently upward and the neck is exposed (Fig. 3). Dissection should be gentle and bleeding controlled carefully. One troublesome vessel is found, usually, passing from the pharyngeal wall to the diverticulum.

The neck of the diverticulum consists of two layers—the mucosal layer and a muscular layer. The muscular layer is divided a reasonable distance from the oesophagus so that it will not retract and make closure difficult. The oesophagus should not be grasped and held with any type of toothed forceps. Stay sutures of fine silk may be used.

After the muscular layers have been cut, division and suture of the mucosa is started. Interrupted sutures of fine silk are used, placed and tied so that the knots are within the lumen. No effort is made to invert the mucosal edges.

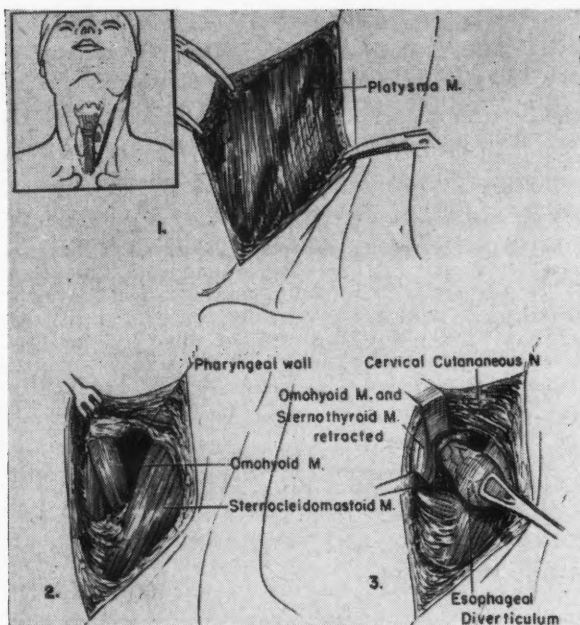


Fig. 2

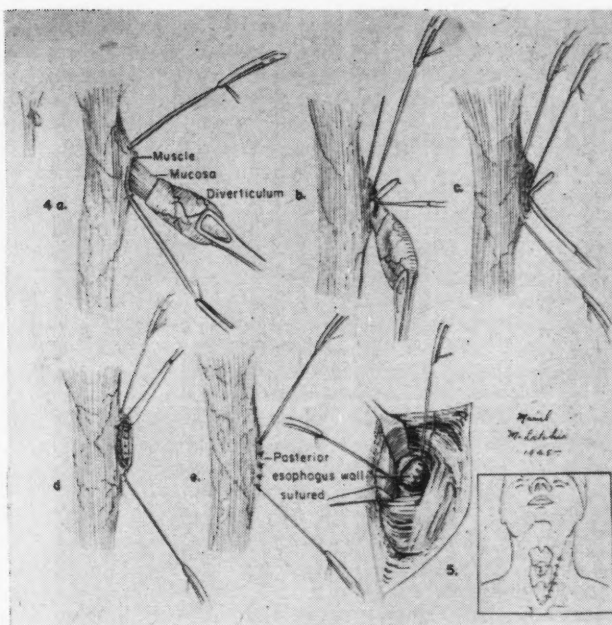


Fig. 3

Fig. 2.—Diagram to show the position of the incision (inset) and the stages of dissection. (1) Skin incision retracted exposing the platysma muscle. (2) Cut-edges of skin and platysma muscle retracted exposing the omohyoid muscle, the sternocleidomastoid muscle, and the lateral wall of the pharynx. (3) Diverticulum completely freed and drawn out of the wound in preparation for excision. Fig. 3.—Diagram to illustrate the steps of excision of the diverticulum and the closure of the resulting defect. (4a) Incision through the muscular layer completed. Mucosa not yet cut, stay-sutures at upper and lower ends of muscle incision. Note retraction of muscularis. (b) Incision of mucosa begun. First mucosal suture tied; second suture placed but not yet tied. (c) Diverticulum removed; mucosal suture continued. (d) Closure of mucosal layer completed; first muscle layer suture placed but not tied. (e) Closure of muscle layer completed. (5) *In situ* view of the field of operation before closure of the wound. Inset: Operation complete. No drain.

The muscular layer is now sutured over the mucosal layer, and, if cut properly, there will be no tension. The surrounding tissues are allowed to fall into their normal relationships. The platysma is sutured with fine silk, and the skin closed with clips. No drains are used.

**Postoperative management.**—Sips of fluids are allowed at once. The patient is permitted out of bed on the second day. Fluid diet is allowed in increasing amounts for three or four days, then soft food, and regular diet after ten to fourteen days. Antibiotics are continued for four or five days.

Only seven cases have been operated upon—six by myself, and one by Dr. S. M. Hudecki, an associate of mine on the staff of the Hamilton General Hospital. There was only one female patient. The average age was 58.1 years. The youngest patient was 47; the oldest 72.

All incisions have healed by primary union, and there have been no complications. All patients have been completely relieved of their symptoms. The average stay in hospital after operation for six cases was seven days. Dr. Hudecki's patient had a fracture of the neck of the femur, and therefore had protracted hospitalization.

#### CASE 1

Mr. H.C., age 74. The chief symptom was difficulty in swallowing, which had been increasing for about seven years. This patient was referred to earlier as the one who had become practically a recluse. He was markedly underweight and dehydrated, and a rather poor operative risk.

A large diverticulum was found, but only minimal constriction occurred after operation and the patient has no difficulty swallowing. He has gained weight and strength and states that the operation has changed his life.

#### CASE 2

Mr. A.B., age 60. The complaint was difficulty in swallowing food, either solid or liquid. Symptoms had been present for about one year, gradually increasing in severity. He had lost about 15 pounds in one year.

A large, soft mass was palpable just above the left clavicle. He was rather emaciated but appeared to be a reasonably good operative risk.

A small recurrence was present after operation. The patient states that he feels perfectly well and swallows any food without difficulty. It is doubtful if the recurring diverticulum will become large enough to bother him during his remaining span of life. It was present in an x-ray taken one year following the operation, and has not changed in size over a period of three years. It may represent incomplete removal rather than a recurrence.

#### CASE 3

Mr. A.K., age 61. He had noticed a gradual onset of difficulty in swallowing over a period of ten years. There had been no weight loss. His past history is of some interest. A resection of his transverse colon was performed in 1938 because of adenocarcinoma. A very small pharyngo-oesophageal diverticulum was noted at that time, but it was not producing symptoms.

Fig. 4a and 4b show the condition before operation, and again twenty months later. A diverticulum about the size of a pea is present. He swallows without difficulty, and feels perfectly well.

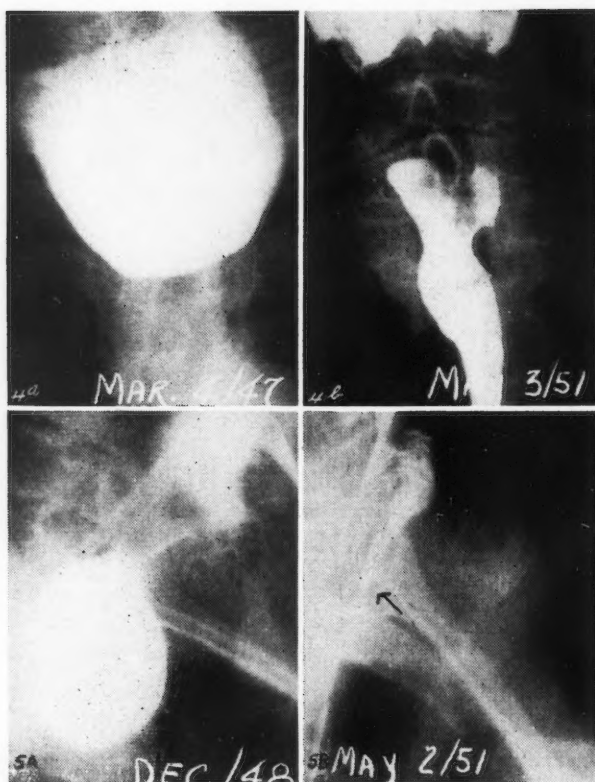


Fig. 4

### CONSANGUINITY AND ITS SIGNIFICANCE IN THE FAMILY HISTORY

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Montreal

IT HAS LONG been recognized by both doctors and laymen that marriages between cousins are liable to produce defective children. Nevertheless, the significance of consanguinity (marriage of blood relatives) is frequently overlooked by the doctor when he is trying to assess the possible hereditary factors in a patient's disease. Finding that a patient's parents are related may be the clue that leads to the diagnosis of one of the many rare recessively inherited diseases. This paper is presented to emphasize the importance of a routine inquiry about consanguinity when taking the family history.

What is meant by a recessively inherited disease? The genes, which determine many of the body's morphological, biochemical and physiological characteristics, exist in pairs, each pair having a specific function. Everyone re-

#### CASE 4

Mr. A.A., age 47. His complaint was difficulty in swallowing, gradually increasing over a period of three years. His weight had not changed, but he stated he could not eat enough for heavy work. He could eat fairly well at home because he would "work his neck like a duck".

Three years postoperatively he has no difficulty swallowing, and enjoys all kinds of food (Figs. 5a and 5b).

5. Mr. J.T., age 61. The complaint was difficulty in swallowing. He had not lost weight and his general health was good. Examination showed a well developed diverticulum, which was operated on. The patient now eats and drinks anything without difficulty, and feels well pleased with the result of his operation.

#### CONCLUSIONS

A one-stage operation for pharyngo-oesophageal diverticula is presented. There have been no complications and the results have been uniformly satisfactory.

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ceives one member of each pair of genes from each parent. Sometimes a gene is changed into an abnormal form and fails to function properly. If the normal member of this gene pair is able to perform its function well enough to fulfil adequately the function concerned, the body will appear normal, and the defective gene is called "recessive" to the normal member of the pair. Now if a married couple both have one defective and one normal member of a given gene pair, they will both be outwardly normal. Each parent may pass either the normal or the defective gene on to the child. If they both pass on the defective gene, the child will have no normal member of this gene pair and will develop a disease, the nature of which will depend on the gene function concerned. Such a disease is said to be recessively inherited because it is transmitted to the child through the germ plasm, by normal parents. Any child of such parents (and therefore any sibling of an affected child) has one chance in four of receiving both defective genes and being affected.<sup>4, 8</sup>

What is the significance of consanguinity in relation to this scheme? If a given defective gene is rare, the chances of two unrelated people who

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both carry this gene marrying each other are small. First cousins, on the other hand, have the same grand-parents, and if a defective gene is "running in the family" the chances of two first-cousins both inheriting the gene are relatively high. So a child whose parents are first cousins has a greater chance of inheriting the same defective recessive gene from both parents and developing a hereditary disease than does a child of unrelated parents.<sup>4, 8</sup>

Reasoning conversely, it follows that a child with a rare, recessively inherited disease is more likely than other children to have parents who are cousins. Therefore, when a child with a disease of obscure etiology is found to have parents who are cousins, this suggests that the etiological agent may be a recessive gene. This clue may direct the physician's line of diagnostic thought towards the known recessively inherited diseases and thus aid in making a diagnosis. It will also serve as a warning that the same disease may have a 25% chance of recurring in any future offspring of these parents.<sup>4</sup>

The following cases, seen during the past year at the Children's Memorial Hospital, will serve as examples of how useful it is to inquire about consanguinity when taking the family history. Since this paper is concerned with consanguinity rather than any specific disease, the clinical details will not be discussed. The nature of the consanguineous relationship was defined simply by asking the parents if they were related in any way and, if they answered in the affirmative, having them outline the family tree back to the common ancestor, stating the names of the individuals concerned.

#### CASE 1

Informants—mother and father. A 3 year old French-Canadian male was admitted to the hospital with a right upper lobe pneumonia. The parents were first cousins (Fig. 1) and the first two children, males, aged 12 and 8 respectively, were deaf-mutes. A 3 months' old sister was normal, and there were no other known cases of deaf-mutism in the family. Since deaf-mutism is known to be recessively inherited in many instances<sup>6</sup> the parental consanguinity is strong evidence that such is the case here. After the first deaf-mute child was born,

#### DEAF-MUTISM

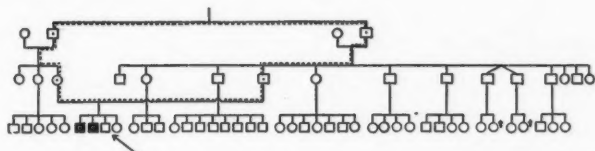


Fig. 1.—Deaf-mutism occurring in the offspring of a first-cousin marriage. Circles represent females, squares represent males. Black symbols represent affected persons. Marks those who died in infancy. The dotted symbols represent unaffected persons who were presumably carrying the defective gene.

the parents could have been advised that each subsequent child probably had one chance in four of being a deaf mute.

#### CASE 2

Informant—mother. A 7 month old English-Canadian male infant was admitted because of loss of appetite, weight loss and fretfulness. The family history revealed that there was a normal, 23 year old sister, that there were no known cases of congenital defects in the family, and that the patient's parents were first cousins (Fig. 2). The patient was found to have a grossly enlarged heart, hepatomegaly and a blood pressure of 108/75. The differential diagnosis included idiopathic myocarditis, endocardial fibroelastosis, aberrant coronary artery and glycogen storage disease of the heart. The fact that the parents of the child were first cousins was evidence in favour of glycogen storage disease of the heart,<sup>3</sup> and a muscle biopsy was ordered. Unfortunately this could not be done due to the child's critical condition, but the post mortem examination showed massive deposition of glycogen in the heart muscle.

Since the mother is now having her menopause the problem of further children does not arise, but it was possible to warn other members of the family of the risk of marrying relatives, since they may also be carrying the pathological gene.

#### GLYCOGEN STORAGE DISEASE of the HEART

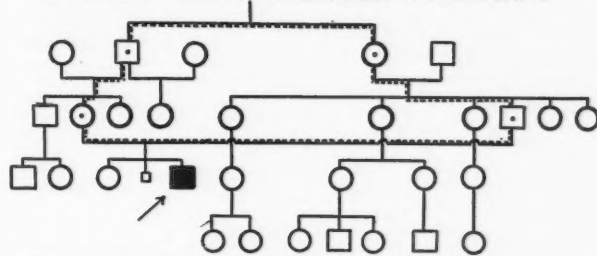


Fig. 2.—Glycogen storage disease of the heart occurring in the offspring of a first cousin marriage.

#### CASE 3

Informants—mother and father. A 7 year old French-Canadian girl was admitted with her whole body covered by thick, horny scales which had become progressively worse since birth. There were two unaffected sisters, aged 10 and 3 years respectively, and no other similar cases were known in the family. A diagnosis of ichthyosis sauroderma was supported by the finding that the parents were second cousins, since this disease is known to show recessive inheritance, with a high incidence of consanguinity in the parents of affected children.<sup>1</sup> Any future children have a 25% risk of being affected.

#### ICHTHYOSIS SAURODERMA

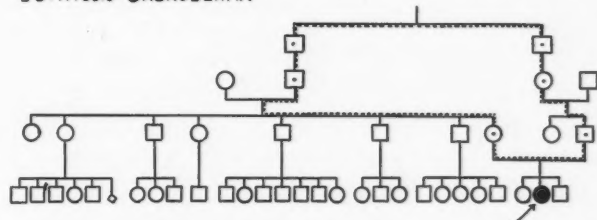


Fig. 3.—Ichthyosis sauroderma in the offspring of a mating between second cousins.

#### CASE 4

Informant—mother's sister. A 1 month old French-Canadian female infant was admitted with bilateral talipes calcaneo-varus, and bilateral congenital dislocation of the hip. The diagnosis was confirmed radiologically. The first child in this family, a female, died in another hospital at the age of 2½ years following operation for a similar condition. A 10 year old boy and a

9 year old girl are normal. The fourth child died in the Children's Memorial Hospital at the age of 5 months following cyclic bouts of fever and diarrhoea of unknown origin. He also had bilateral club feet and dislocated hips. The patient was the fifth, and (to date) last child. The father's nine siblings were stated to be well but had not been seen for many years. No other congenital defects were known in the family.

The occurrence of this rare condition in several offspring of the same parents, coupled with the fact that the parents are third cousins suggests strongly that a recessive gene is the etiologic agent in this case. If the significance of the parental consanguinity had been realized after the first defective child was born, the parents could have been warned that (unlike most cases of clubfoot or congenital dislocation of the hip) the risk of recurrence in this family was probably 25% for each subsequent child.

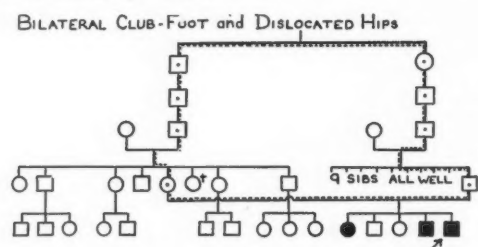


Fig. 4.—Bilateral clubfoot and congenital dislocation of the hips in the offspring of a mating between third cousins.

#### CASE 5

Informants—mother and father. A 2 weeks' old French-Canadian male infant was admitted with vomiting, cyanosis and dehydration. Two sisters, age 5½ and 4 years, are well. The third child born in this family died outside of hospital at 2 weeks of age following episodes of cyanosis and vomiting. No autopsy was done. The fourth child, a 6 month old girl had been admitted to the Children's Memorial Hospital with similar symptoms and had died. Autopsy had revealed almost complete absence of the adrenal cortex. Because of this, adrenal insufficiency was suspected in the patient, and he is now doing well at the age of 1½ years on the appropriate replacement therapy. The parents state that they are fourth cousins (Fig. 5).

So far only a few cases of this condition have been reported,<sup>2, 5, 7</sup> and little is known of its familial distribution. The occurrence of the condition in two, and possibly three siblings may be interpreted as a highly unlikely coincidence, or as evidence of an etiological factor operating within this family group, but does not distinguish whether this factor is environmental or genetic. The existence of parental consanguinity, even of this slight degree, favours the idea that this type of adrenal insufficiency may be recessively inherited. It is hoped that other investigators who encounter such cases will record details of such patients' siblings and the presence or absence of parental consanguinity.

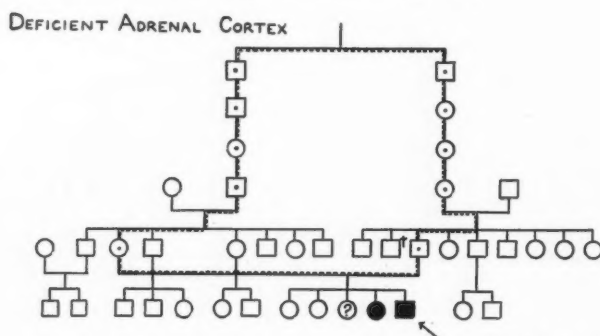


Fig. 5.—Severe cortical adrenal aplasia occurring in the offspring of a mating between fourth cousins.

The above cases demonstrate that the finding of parental consanguinity may be significant in cases where there is doubt as to the etiology of a patient's disease. Of course consanguinity will be found relatively rarely in general medical practice, but it might be found a good deal more often if it were looked for routinely. It is suggested that little information of value can be found about a patient with, say, deaf-mutism by asking about the familial incidence of diseases such as allergy, epilepsy or cancer, since the genetic background of these conditions is so obscure that their presence or absence in the family tells one nothing about the patient's deaf-mutism. The same time and effort spent in asking about consanguinity would sometimes uncover a specific and helpful piece of information.

#### SUMMARY

Five cases are reported of rare diseases occurring in the offspring of consanguineous matings. The medical significance of consanguinity is discussed, and it is suggested that information about parental consanguinity should be recorded as an integral part of the family history.

The author is indebted to Dr. Frances McCall for permission to publish Case 1, and to Dr. P. N. MacDermot for permission to publish Case 2. The work was aided by grants from the Banting Research Foundation and from the Dominion-Provincial Public Health Funds.

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**THE LOCAL TREATMENT OF DOG BITES.**—The author deplors the common practice of cauterizing dog bites with fuming nitric acid, concentrated silver nitrate, formalin, iodine, ether, or alcohol. Dog bites must be treated as contaminated soft tissue wounds, therefore soap and water cleansing, debridement (if necessary), irrigation, and suturing if indicated, but no cauterizing. Soap and water cleansing has been found more efficacious than thorough nitric acid cauterization in combating the rabies virus, and there is no devitalized necrotic tissue left as a nidus for infection. Caustic cauterization frequently leaves disfiguring scars, whereas this is almost unknown with soap and water and careful suturing.—Vinnard, R. T.: *Postgrad. Med.*, 10: 322, 1951.

## BRONCHOGENIC CARCINOMA\*

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A REVIEW OF THE CASES of bronchogenic carcinoma encountered at the Toronto General Hospital after the report of the first successful pneumonectomy by Graham<sup>1</sup> in 1933, and up to the end of 1945, has been presented previously by Gagnon<sup>2</sup> who analyzed both the clinical features and operative results. Since that report, interest has continued to grow in this disease which seems to be occurring more frequently, and in which early diagnosis still presents such a difficult problem. For these reasons, it has been thought worthwhile to bring the study of the cases seen in this one hospital up to date, presenting the data largely in tabular form, with a summary of the survival statistics in which the cases previously reported are included.

In the three year period from 1946 to 1948, there were 172 cases in which the diagnosis of bronchogenic carcinoma was made, but of these, definite pathological proof was obtained in only 124. This latter group comprises the basis for the following study. In the remaining 48 cases, the clinical diagnosis appeared quite definite from the findings charted in 37, but the other 11 cases, although finally coded as bronchogenic carcinoma, can only be considered as "carcinoma suspects" for record purposes.

The striking increase in incidence of this disease, that has been universally noted, is reflected in our hospital records. Wynder and Graham<sup>3</sup> have found it to be now the commonest visceral carcinoma in the male sex, and a study of the cases admitted to the Toronto General Hospital during the same three year period, reveals the fact that, even in this selected population, it has been surpassed in frequency by carcinoma of the prostate alone, and in that instance only by a very few cases. In this series it was impossible to determine what factors might have been responsible for the change. The reports of Wynder and Graham<sup>3</sup> and Levine, Goldstein, and Gerhard<sup>4</sup> seem to show on sound statistical basis, the influence of excessive and prolonged cigarette smoking. In isolated instances, the inhalation of other noxious vapours might also prove to have important relations to the development of the disease, and attempts to elicit specific information of this type now form an integral part of

history-taking in all patients in whom the diagnosis is suspected. At any rate, there is no remaining doubt but that the increase in incidence is a very real one, and an intensive investigation must be continued in an attempt to discover the various factors responsible for the increase.

The main problem remains that of early diagnosis, particularly in view of the tendency of the growth to relatively early involvement of regional lymph nodes, and the difficulty in eradicating the disease by surgical means once this extension has occurred (Table IX).

Unfortunately the most important symptom, that of cough, is of insidious onset and rarely

TABLE I.

SEX INCIDENCE (124 cases)	
Male.....	91.1%
Female.....	8.9%

TABLE II.

AGE INCIDENCE (124 cases)		
Decade	No. of cases	Peak incidence
30 to 39.....	7	56 years
40 to 49.....	26	
50 to 59.....	44	
60 to 69.....	36	
Over 70.....	11	

does a dramatic episode, such as massive hæmoptysis, draw attention to the disease at an early stage. In the age group affected, cough has long been accepted by the lay population and all too often by the medical profession, general practitioners and specialists alike, as an accompaniment of the ageing process, and explained away in non-specific terms such as smoker's cough, morning cough, chronic bronchitis, or else attributed to sinus trouble, bad throat, etc., without proper investigation. If this situation is to be corrected, attention must be directed to every case in which a cough develops for the first time over the age of forty, or in which there has been a change in the nature of a pre-existing chronic cough, particularly if this change appeared in a male patient with a previous history of lower respiratory infection. As a corollary, it is also true that one must suspect the presence of an endobronchial neoplasm in any patient in this age group who suffers an attack of pneumonia, and follow the case until the radiological change has

\*Presented at a Surgical Staff Meeting, Toronto General Hospital, 1950.

completely subsided before accepting a purely inflammatory etiological basis for the clinical picture.

Unfortunately the initial symptomatology (Table III), being commonly of this non-specific type, has seldom in this group of cases, resulted in the patient consulting a physician at the time of onset of the symptoms. It is not until an association of symptoms develops, usually representing advancing spread of the disease as evidenced by general complaints such as weakness, fatigue and loss of weight, or else the appearance of some more dramatic evidence of the pathological process such as blood-spitting or chest pain, that

the patient feels constrained to seek medical advice. Nevertheless, it is felt that if the medical profession as a whole can be educated to bear in mind the possibility of bronchogenic carcinoma as the causative factor in any of these symptoms complexes, earlier diagnoses will be made more frequently and the survival statistics should improve as a result.

In the investigation of such a case, all the standard methods outlined in Table IV are available. An x-ray shadow that persists or appears in a previously clear lung field demands further investigation. However the common location of a bronchogenic carcinoma near the hilus is such

TABLE III.

SYMPTOMATOLOGY (124 cases)	
<i>First symptoms</i>	
Cough and sputum.....	38.7
Previous T.B. in.....	1
Survey film in.....	1
Previous respiratory infections.....	16.9
Survey film in.....	2
Chest pain.....	11.3
Pleuritic.....	7.4
Steady.....	3.2
Tightness.....	0.8
Weakness and fatigue (including anorexia).....	10.5
Dyspnoea.....	5.6
S.V.C. obstruction in.....	2
Survey film.....	4.03
Signs of metastases.....	4.03
Skeletal pain.....	2.4
Intracranial metastases.....	1.6
Hæmoptysis.....	3.2
Previous T.B. in.....	1
Hoarseness.....	2.4
Arthralgia.....	1.6
Wheeze.....	0.8
Lump in neck.....	0.8
<i>Symptoms present when diagnosis made</i>	
Cough and sputum.....	79.8
Chest pain (76 cases).....	61.3
Pleuritic.....	35
Steady.....	21
Tightness.....	10
Root.....	5
Vague distress.....	5
Loss of weight.....	58.1
Weakness and fatigue.....	43.5
Dyspnoea.....	37.1
Hæmoptysis.....	37.1
Previous respiratory infections.....	32.3
Hoarseness.....	10.5
Wheeze.....	7.3
<i>Miscellaneous</i>	
Pain of bony metastases.....	5.6
Dysphagia.....	4.03
Signs of intracranial metastases.....	3.1
S.V.C. obstruction.....	2.4
Lump in neck.....	2.4
Arthralgia.....	1.6

TABLE IV.

METHODS USED IN PROVING DIAGNOSIS (124 cases)	
Bronchoscopy.....	48
Biopsy of lymph nodes.....	16
Supraclavicular	
Also 1 axillary	
1 cervical	
Sputum examination.....	13
Suspicious in 5 additional cases	
Examination of pleural fluid for malignant cells.....	10
Thoracotomy.....	10
19 thoracotomies done but no biopsy in 9 as	
previous pathological diagnosis had been made	
Aspiration biopsy.....	5
Bronchoscopic aspiration.....	3
Suspicious in 3 additional cases	
Biopsy of rib.....	2
Biopsy of soft tissue.....	1
Tumour in chest wall	
Thoracoscopy.....	1
Pleural implant	
Operative specimens.....	35
Post-mortems.....	16

that incontrovertible radiological signs often do not appear in association with an early lesion. Such evidence will appear only when endobronchial occlusion results in peripheral atelectasis, or when glandular involvement is exhibited as an enlarged hilar shadow. Consequently routine chest films which are becoming more frequent in group surveys, can seldom be expected to demonstrate an early lesion unless it is one of the less frequent peripheral neoplasms which produce "coin shadows" with their tendency to later lymphatic extension. In order to make the earliest possible diagnosis then, other methods will have to be utilized to the full, particularly in the investigation of the case in which the presence of a carcinoma is only suspected in comparison to the patient in whom the clinical picture points more definitely to the correct diagnosis.

Of these other methods of investigation, two are particularly important and should be employed in every case in which clinical or radiological signs suggest the need for additional procedures. Bronchoscopy has long been recognized as the method of choice in making a definite diagnosis, and as demonstrated in Table V, it remains the most valuable investigative procedure in this centre. Of 89 cases in which it was performed (71.8% of the group of proved cases) a positive pathological diagnosis was obtained in 57.3%, and supplementary information of importance discovered in an additional 22.5%, so that the examination was of definite value in about 80% of these patients.

It has been reported that sputum examination for malignant cells gives a very high percentage of positive diagnoses in competent hands, but

TABLE V.

RESULTS OF BRONCHOSCOPY (In 89 (71.8%) of 124 cases)		
1. Positive.....	51	57.3%
Positive biopsy report..	48	
Previously negative.....	4	
Previously reported as stenosis.....	1	
Bronchoscopic aspiration.....	3	
positive (no tumour seen)		
2. Supplementary information obtained...	20	22.5%
Biopsy of visible tumour negative....	3	
Specimen and report lost (verbal report positive).....	1	
No biopsy taken of visible but obviously inoperable tumour...	1	
Stenosis	15	
Extrinsic pressure....		
Infiltration of wall		
	71	79.8%
3. Negative.....	18	
Negative or non-specific report including—oedema—secretions—blood		
Total	89	

Procedure of value in 79.8% of cases in which it was done.

**Mortality:** 1 postoperative death due to meningitis associated with broncho-pneumonia and pulmonary oedema.

TABLE VI.

CLINICAL EVIDENCES OF INOPERABILITY In 70 inoperable cases—(56.4%)	
Hæmatogenous metastases.....	22
Bone	mostly
Brain	
Opposite lung	
Lymphatic metastases.....	17
Supraclavicular	
Also 1 axillary	
1 cervical	
Bronchoscopic findings.....	15
Widening and fixation of carina	
Tumour at carina	
Recurrent nerve paralysis.....	13
Pleural involvement.....	11
(Only if pathological examination showed malignant cells)	
Mediastinal involvement.....	10
Involvement oesophagus	
Obstruction of S.V.C.	
Gross widening of mediastinum	
Phrenic nerve paralysis.....	7
Associated conditions.....	6
Serious cardiovascular disease.....	4
Cerebral infarct.....	1
Severe pernicious anæmia.....	1
Reduction in vital capacity.....	3
Age.....	2
Involvement of chest wall.....	2
Thoracoscopy showing pleural implant.....	1
Draining of foul empyema.....	1
Died after bronchoscopy.....	1
Discharged to return for operation and did not return.....	1
Operation advised but refused.....	1
Bloody pleural fluid.....	1
No malignant cells but considered inoperable	

this test has not as yet been used in a sufficient number of cases here to present statistical evidence of its accuracy. Provided trained personnel are available to perform the cytological examination, it is believed that the procedure will prove to be an important addition to diagnostic methods.

Despite the utilization of x-ray studies, bronchoscopy and sputum examination, there will remain a small group of patients in whom the diagnosis cannot be proved and in whom there is no evidence of distant spread of the disease. This is particularly true of the peripheral lesions producing the coin shadows mentioned above and representing the type of case that may be seen more frequently with the widespread use of chest survey films. Provided one can rule out clinically a primary malignancy elsewhere, and provided there is no incontrovertible evidence of tuberculosis in the remaining lung fields, thoracotomy is indicated as a diagnostic procedure, with removal of the lesions for pathological examination. It is often difficult and even impossible to make a definite diagnosis even on palpation of the lesion, and because of the

possibility that the process is tuberculous in origin, a limited resection is usually done, either of the local lesion or of lymph nodes in the vicinity, if they are involved. Only if the pathological report demonstrates a bronchogenic neoplasm, is further excision therapy carried out.

Once the diagnosis has been made clinically, a decision must be made regarding the "operability" of the lesion. This term is used to describe one's interpretation of the evidence available on examination, that resection should be possible or that thoracotomy is not indicated because the disease has spread locally or to distant organs, making resection technically infeasible, cure impossible, and attempts at palliation unjustifiable. Other factors may affect this decision, such as the age and general condition of the patient, or the presence of associated serious diseases. A record of the findings which were thought to indicate inoperability in this series are summarized in Table VI. It is interesting to note from a comparison with the statistics of the earlier series reported (Table VII), that the "operability rate" has risen only very slightly, and in the entire group of patients clinically thought to have bronchogenic carcinoma, is only 33.5%. The fact that but one in every third case in which the diagnosis is made is considered

TABLE VII.

ANALYSIS OF OPERABILITY AND RESECTABILITY RATES		
	Operability	Resectability
Previously reported series 1934-1945 224 proved cases.....	38.4	21.9
Present series 124 proved cases.....	43.5	28.2
Present series 161 cases with clinical diagnosis.....	33.5	21.7

operable, emphasizes the urgent need for earlier diagnosis.

Exploratory thoracotomy was performed in 54 cases over the three year period under consideration, and in 19 patients resection was not technically possible, lowering the "resection rate" to 21.7%, or in other words, resection was performed in a little better than one out of every five cases. To express these percentages more succinctly, this means that not only will just one of every three cases be considered operable, but in addition, resection will prove possible in only two of every three cases in which thoracotomy is performed.

Although the improvement in operability and resectability rates has not been as dramatic as one would wish, there has nonetheless been a striking improvement in the postoperative mor-

TABLE VIII.

ANALYSIS OF POSTOPERATIVE MORBIDITY AND MORTALITY						
	Previous series 1934-1945			Present series 1946-1948		
	No. of cases	Morbidity	Mortality	No. of cases	Morbidity	Mortality
1. Lobectomy	5	2—40% 1 bronchopleural fistula with empyema 1 empyema	0	6	0	0
2. Pneumonectomy	44	19—43.2% 6 pulmonary embolus 3 atelectasis 3 massive hæmorrhage 3 empyema 2 wound disruption 1 hemiparesis 1 broncho-pneumonia	16—36.3%	29	8—24.1% 2 atelectasis 1 fatal 1 case recovered 2 empyema 1 recovered with aspiration only (abscess opened at operation) 1 required rib resection and drainage with recovery 2 bronchopleural fistula both closed spontaneously 1 left ventricular failure fatal 1 pulmonary embolus fatal	3—10.3%
3. Entire series	49	21—42.8%	16—32.6%	35	8—22.9%	3—8.6%

TABLE IX.

ANALYSIS OF POSTOPERATIVE SURVIVALS												
A. ANALYSIS OF 29 PNEUMONECTOMIES												
Lymph nodes			Results		Survival period							
Positive	Nega- tive	Not noted			P.O.	Less than 1 year		1 year +		2 years +		3 years +
					Death	0-6 mos.	6-12 mos.	12-18 mos.	18-24 mos.	24-30 mos.	30-36 mos.	36-42 mos.
4	2 1 (in- volve- ment rib and rib bed)	1 2	1. P.O. mortality 2. Died of disease	3 7	3		2	4		1 (age 76)		
2	3 (pleural involve- ment in 1)	—	3. Alive with recurrence	5			1	1	2 (pleu- ral nod- ule pre- sent in 1)		1	
3 (2 have no follow up beyond 1 month)	9	2	4. Alive without evidence of clinical recurrence	14		3	4	2	1 (nodes nega- tive)	2 (nodes nega- tive)	1 (nodes nega- tive)	1 (nodes nega- tive)
B. ANALYSIS OF 6 LOBECTOMIES												
1 1	1 2	1	1. P.O. mortality 2. Died of disease 3. Alive with recurrence 4. Alive without evidence of clinical recurrence	0 2 1 3			1 (nodes posi- tive)	1 (nodes nega- tive)	1 (nodes nega- tive)			
4	11	2	Analysis of 17 cases (approximately 50%) alive without evidence of clinical recurrence			3	5	3	2	2	1	1

bidity and mortality (Table VIII). The present mortality rate for pulmonary resection in bronchogenic carcinoma of 8.6% (10.3% in pneumonectomy) brings the hazard of surgical treatment for this lethal disease down to such reasonable figures that one is no longer deterred from advising thoracotomy on these grounds. Consequently more and more patients should be accepted as satisfactory surgical risks, particularly as the postoperative morbidity has shown a similar decline due to improvement in anaesthetic technique, more careful attention to postoperative endobronchial toilet, and widespread use of increasingly effective antibiotic agents. As a result, the average period of hospitalization has been markedly shortened and the economic strain upon the patient lessened.

When the survival statistics are reviewed (Table IX) it becomes apparent, as in the earlier report, that the extension of the disease to regional lymphatic nodes results in a sharp reduc-

tion in the survival span, and the importance of the factor is again demonstrated when it is noted that in 11 of the 17 cases alive without evidence of residual disease at the time the report was prepared, there was no evidence of involvement of the regional nodes. Of course this merely stresses the fact that in this particular carcinoma with its tendency to early lymphatic extension, early diagnosis and prompt treatment is essential if "cures" are to be obtained.

Sufficient time has now elapsed to formulate some opinion as to "cure rates" in the patients that have undergone a successful resection several years ago. The entire group of resections reported in these two papers have been followed up to December 31, 1949, and as outlined in Table X, the three, four, and five year survival rates, expressed as percentages, appear stabilized at a slowly declining plateau level, as is characteristic of so many different carcinomatous lesions that have been treated surgically. The



mitted publication of the cases from the Thoracic Surgical Service of the Toronto General Hospital.

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## SAFER ANÆSTHESIA\*

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ONE OF THE PREREQUISITES of safe surgery is safe anæsthesia. This must be administered by one who is willing to accept the inherent responsibilities.

Safe anæsthesia requires more than a knowledge and practice of technique although this in itself is of major importance. It requires that medical knowledge and thought be diverted and concentrated upon the physiological requirements of a patient about to be anæsthetized, being anæsthetized and having been anæsthetized.

There are surgeons who will dictate the anæsthetic and prescribe the post-anæsthetic course, the reason being that their knowledge is as good as that of their anæsthetist, and that they are unable to place that confidence in him that they should. Had they the knowledge, firstly, that the anæsthetic of choice is being given to their patient, secondly, that their patient's physiological equilibrium was being intelligently controlled and thirdly, that they were sure of obtaining the best possible surgical field in which to work, then they would be enabled to work in a state of mental calm and to respond to the anæsthetist with a feeling of partnership. Such is the ideal.

Factors producing safe anæsthesia may be discussed according to the aforementioned states. *Before the operation.*—A knowledge of the patient's past and present history and clinical condition must be obtained in order to avoid mistakes. By so doing an estimate of the patient's psychological and pathological condition can be made which may modify the choice or technique of anæsthesia. Although preference may be shown to one technique or another, through a man's own knowledge of his abilities, there is no rule of thumb which is the safest in all cases.

The chief points to be ascertained at this stage are the patient's reactions to previous anæsthetics and operations, the age and build of the patient, the assessment of the cardiovascular and respiratory systems, the presence of neurological lesions and of impaired liver or kidney function.

More immediate details must also be probed, such as the ingestion of recent food or fluids, remembering in this instance that the emptying time of the stomach may be delayed under certain circumstances; the presence of dentures especially partial dentures and bridges, also loose teeth. Finally, the state of hydration of the patient is of great importance. While these investigations are being made, the patient's confidence will be gained.

With these facts in mind, a safe plan can be made for the conduction of the anæsthesia commencing with premedication.

*Premedication.*—The rationale of premedication is sufficiently well known to be omitted in this talk. Suffice to say, it should not be routine in dosage but that it should suit the patient's requirements.

The actual choice of the anæsthetic is made according to the previous information obtained and modified by the site of the operation, the operative posture and, if necessary, according to the views of the surgeon.

### ADMINISTRATION OF THE ANÆSTHETIC

*Safety factors in intravenous anæsthesia.*—(a) Proper equipment makes the procedure safer and more easy. Less difficulty is encountered with the use of syringes which have eccentric nozzles. There is less chance of getting into trouble using needles which have short bevels and are gauge 22 to 23.

(b) Strength of solution. Unnecessarily high concentration of the solution should be avoided, if a more dilute one will do. 2½% pentothal may be considered the optimum for induction or intermittent doses of pentothal. It must not be forgotten that once the drug has been given it cannot be withdrawn.

(c) Venipuncture. When a vein is selected in the antecubital fossa, the vein should be carefully palpated before application of the tourniquet in order to make sure that there is no underlying artery. With the needles mentioned above, it is unlikely that a perivenous injection will be made. Should this occur, however, the injection should be stopped and the area infiltrated with 1% procaine. After injecting the

\*Read before the 5th division of the O.M.A. on September 12, 1951.

first 3 or 4 c.c. it is a wise precautionary measure to see if the patient has any pain radiating into the hands, which might indicate an inadvertent arterial injection. Once this has occurred, the correct treatment must be undertaken.

(d) It is unwise to give pentothal without oxygen, or better still, nitrous oxide and oxygen together, this latter reducing the quantity of pentothal necessary for any procedure. Pentothal should not be given in a casual method without adequate supportive measures at hand. It may be remembered here that the advent of pentothal has raised the mortality rate of anæsthesia.

(e) A number of conditions exist in which pentothal is not necessarily contra-indicated but in which it must be used with caution. The age of the patient may affect the quantity and rate of injection. Extremes of ages in themselves do not contra-indicate its use but they do modify its introduction. Severe cardiovascular disease or any condition where there is severe impairment of respiratory function make one think twice before using pentothal. Pentothal itself may have a depressing action on the heart muscle. Severe kidney dysfunction and impairment of liver function may also modify our choice. In cases of severe shock and burns it is wiser to keep away from the ultra short-acting barbiturates. The one great contra-indication which must never be forgotten is severe inflammatory disease around the neck, such as in Ludwig's angina.

(f) It is unwise to endeavour to prolong a spinal anæsthetic which is wearing off, by an injection of pentothal alone.

(g) Pentothal should not be given in the office or in the house unless oxygen and a suitable method of administering it is at hand.

(h) It is unwise to use pentothal if subsequent proximity to the patient's face and maintenance of an airway is going to be denied by virtue of the operation.

(i) It is unwise to use pentothal for operations within the mouth unless suitable arrangements are made for conserving the airway and preventing inhalation of foreign material.

(j) It is unwise to use pentothal alone for really stimulating operations unless the possibility of laryngospasm can be controlled or obviated.

#### SAFETY FACTORS IN INHALATION ANÆSTHESIA

*Equipment.*—If, as is generally the rule, an anæsthetic machine is used, this must be kept

properly serviced, valves that stick create increased resistance to the respiratory effort, soda lime that is not changed frequently will initiate early acidosis. Masks should be properly cleansed between cases and kept in a serviceable condition. Cylinders should be carefully checked before and after anæsthesia in order to avoid mixing them and in order to prevent the commencement of a case with an empty tank. It is extremely helpful to have a well trained orderly or nurse to do these jobs for one but it must not be forgotten that it is the anæsthetist's responsibility if anything goes wrong.

*During the induction stage.*—When using the open drop method of inducing anæsthesia, care must be taken to protect the patient's eyes and face. When using the machine and mask, the mask must not be firmly pressed to the patient's face until the patient is asleep. During this stage anæsthesia should be induced gradually; if hurried, laryngeal spasm may occur, the reflexes be insulted, and the procedure take far longer than is necessary. Attention should be paid to details such as the holding of the jaw in the proper manner and the instruction of the nursing staff so to do, the administration of oxygen and having suction at hand should need arise for its use.

*The airway.* (a) *Oropharyngeal.*—This should be the proper shape and texture. It is more easily inserted when moist or lubricated. It should not be inserted at too light a stage. When inserted, care should be used to prevent the lips being caught between the teeth and the airway.

(b) *Endotracheal tubes.*—These should be of the correct bore and length, and only introduced after relaxation and better still, relaxation with a topical application of a local agent to the cords. Tubes should be lubricated with a water-soluble anæsthetic jelly: It is a wise precautionary measure always to auscultate the chest in order to see that the tube is properly placed. Their connectors should be of the curved or straight variety, the bore of which should be as great as, if not greater, than the bore of the endotracheal tube. At the outset of the operation the tubes should be firmly fixed to the face to avoid friction in the larynx. Tubing connecting these endotracheal connectors to the apparatus should be as short as possible in order to minimize dead space. Following use, endotracheal catheters should be properly cleaned, sterilized and cared for. When a balloon tube is used, it should be tested im-

mediately before its use and, should the operation permit, the balloon should be deflated several times during a lengthy operation in order to minimize trauma to the wall of the trachea. The balloon should never be over-inflated, for by so doing there is increased pressure on the mucous membrane lining the trachea and the pressure itself may encroach upon the bore of the tube or distend the balloon over the end of the tube.

#### SAFETY FACTORS DURING THE MAINTENANCE OF ANÆSTHESIA

Once the required depth of anæsthesia has been obtained for a surgical procedure, it must be maintained at an even level. The most important guide to this is the type of respiration. During the operation the anæsthetist should watch carefully both the cardiovascular and respiratory responses. Blood loss should be controlled by the usual methods, secretions evacuated from the mouth, pharynx and nasal passages. If, when an endotracheal tube is in place, there are signs or symptoms suggesting a collection of secretion in the tube, the secretions should be aspirated. When at all possible, a chart should be kept of the proceedings, recording the observations on the cardiovascular and respiratory systems, and making note of any drugs given during the course of the operation, also making note of anything of interest affecting the anæsthetic course. Attention should be paid to posture of the patient, its effects upon the cardiovascular and respiratory systems and the possible pressure effects on nerve trunks and pressure areas.

#### SAFETY FACTORS AT THE END OF AN OPERATION UNDER GENERAL ANÆSTHESIA

Before the patient leaves the operating room, the anæsthetist should make sure that there is no collection of mucus, foreign bodies or stomach contents within the mouth, that all packs have been removed before extubation has taken place, and that a perfectly dry airway is ensured. Should the patient have depressed respiration at the end of the operation it is the anæsthetist's duty to compensate for it until there is an efficient respiratory exchange. Care should be taken in transporting the patient from table to bed. At this stage it is unlikely that the full automatic control of the blood vessels will be regained, so that any bad handling may lead to a sudden fall in blood pressure. The anæ-

thetist should see the patient back into bed and under proper supervision. Details as to how much blood and fluid have already been given should be stated with any future advice he may have to give. If oxygen is being administered it is an excellent idea for him to supervise this. Accidents, such as oxygen being administered inadvertently via the stomach tube, can then be avoided. Suction should be available at this stage to prevent aspiration during the period of emergence. If at this stage the patient is not reacting, his natural airway may possibly become obstructed, the passage of a small nasopharyngeal tube will give a really good airway which will not stimulate the reflexes as much as an oropharyngeal airway may.

#### ADDITIONAL FACTORS IN GENERAL ANÆSTHESIA

*Soda lime.*—When an absorbing agent is in use it should be changed when the clinical indications suggest its impending exhaustion. Trichlorethylene should not be used in a circuit with soda lime. When filling the canister it should be filled flush in order to avoid dead space. It should be shaken gently when filled to get rid of the dust which accumulates in it. The addition of a teaspoon of water to the soda lime before the canister is replaced on the machine will prevent small particles being inspired and it will increase the immediate efficiency of the soda lime.

*Relaxing agents.*—There are many agents used for obtaining the relaxation necessary for abdominal and other types of surgery. Familiarity with the various brands and concentrations must be obtained before the agents are used. Different drug houses put out preparations of different strengths. Great care must be used not to use the high potency preparation in lieu of the more usual dosage. Once a relaxing agent has been used, respiration must be assisted in order to avoid anoxia and to get rid of accumulated carbon dioxide. In assisting respiration the tension should be controlled. If at the end of the operation the relaxing agent is still working, then it is the duty of the anæsthetist to assist the respiratory effort until the respiratory exchange is adequate. If a relaxing agent is given to aid intubation the patient should be oxygenated during the interval before the optimum relaxation occurs. For optimum action in this instance, though not for convenience, the relaxing agent should be given first.

## SAFETY FACTORS IN THE USE OF SPINAL ANÆSTHESIA

*The spinal puncture.*—Care should be taken in making the spinal puncture. It should be an absolutely atraumatic procedure. The equipment should be carefully prepared. Clean sterile needles should be not bigger than gauge 20. They should be short bevelled and have a stylet that fits properly. They should be straight and have a point without barb. This latter can be tested by running the needle through a piece of sterile gauze. There are numerous ways of making a lumbar puncture and familiarity with the classical type should be a *sine qua non*. An anæsthetist should have knowledge of the anatomy of the spinal cord and its coverings. He should know the termination of the cord and dural sac at different ages. When performing a lumbar puncture in the midline he must recall the various resistances felt—the supraspinous ligament, the interspinous ligament, the ligamentum flavum and then the dura. He should realize that if he perforates the dura the needle will then pierce the anterior surface of the dura and enter the vascular anterior portion of the epidural space whence will result a bloody tap. Then, unless he strikes bone, the needle will pass through the posterior longitudinal ligament, then the annulus fibrosus of the intervertebral disc, and so into the soft nucleus pulposus. If this latter is penetrated subsequent prolapse of the disc may occur.

*The agents.*—These are commonly divided into light and heavy. The heavy agents are usually used for operations below the umbilicus and the light ones commonly used for those above. Before using a spinal anæsthetic, familiarity with the various techniques in introducing these two differently weighted agents must be known. For a high spinal anæsthetic when the majority of the sympathetic nerves will be paralyzed, it is a wise precautionary measure always to have an intravenous running and oxygen administered by catheter before giving the spinal. With any spinal there must always be at hand an anæsthetic apparatus whereby controlled oxygen can be administered if necessary.

*Control of blood pressure.*—Unless the anæsthetist is absolutely confident he can control blood pressure at will, it is wise to give a vasoconstrictor before a spinal agent is introduced. During the operation under spinal the blood pressure and the respiratory system under be

carefully watched. Should the spinal rise too high the blood pressure may fall more than is desired, immediate elevation of the lower limbs will counteract this until an intravenous or intramuscular injection of a vasoconstrictor drug has been given. At the same time oxygen should be given by mask and bag.

*Additional notes on spinal.*—With the Etherington-Wilson technique the patient sits up during the spinal injection. Occasionally the patient has syncope during this procedure. This is due to the alteration in posture following an injection of morphine. It can usually be obviated by sitting up gently.

Nausea is sometimes troublesome in a high spinal. This may be controlled by deep inhalations of oxygen. The handling of a patient following anæsthesia is of importance if anæsthesia still exists, as the tone of the blood vessels will not be regained. Allowing the limbs to hang down may be sufficient to bring on a condition of shock.

Headaches occur in a number of patients following a spinal anæsthetic or spinal puncture. These are usually caused in the single dose spinal, by seepage through the arachnoid and subsequent low pressure affecting the dynamics of the cerebrospinal fluid circulation. They are best controlled by elevating the foot of the bed and where possible turning the patient on to his abdomen. Intractable conditions of this type will respond to controlled subarachnoid injections of saline. This to be given until the pressure is normal. Other complications may occur and these can be minimized by absolute adherence to an aseptic technique, gentleness in the procedure and care to give the correct drug from a properly sterilized ampoule. Chest complications are just as common after a spinal as a general anæsthetic, so that the postoperative care is just as important following a spinal anæsthetic.

When giving spinal anæsthesia for obstetrics it is important to remember that the pressure within the dura varies according to the labour pains. Trouble may be avoided if the injection is made between the pains.

Do not force a spinal on a patient who has an abhorrence of one; something will be sure to go wrong. Do not over-premedicate a high spinal, their respiratory mechanism is already depressed.

#### VARIOUS SAFETY FACTORS

*Local agents.*—The toxic range of these drugs should be known as also the method of treatment of rapid absorption. It is, therefore, recommended that when local agents are in use oxygen and pentothal be at hand.

*Rectal agents.*—If barbiturates are given by this route knowledge of the correct dosage should be obtained. When avertin is used it should be freshly prepared and tested for the presence of products of decomposition before use. When avertin is given to a patient in bed the anaesthetist should always tend that patient from the bedroom to the operating room. He should have with him an airway, the reason being that the jaw relaxes early after avertin anaesthesia and the patient's respiration is depressed. Should the two exist together a severe degree of anoxia may result.

*The arteriosclerotic patient.*—The physiopathology of this condition has been discussed by Dr. Copping. Guiding these patients safely through their operation is the concern of the anaesthetist. Remember, therefore, all the factors mentioned above which might produce a fall in blood pressure or which might bring about a condition of anoxia. If a general anaesthetic is chosen, light premedication is indicated, followed by a smooth induction avoiding anoxia and laryngospasm. There must be a perfect airway and the maintenance agent must permit of a high concentration of oxygen.

The depth of anaesthesia should be as light as can be permitted by virtue of the particular operation, relaxation being obtained when necessary by the use of curarizing agents. The deeper the anaesthetic the greater will be the fall in blood pressure. Precautions must be taken against falls in blood pressure due to surgical stimuli. Blood loss must be immediately replaced with blood.

The use of an intravenous vasoconstrictor such as 1 in 50,000 neosynephrin by drip can safely control the blood pressure both during, and after the operation. It must, however, be carefully watched especially in the postoperative period, to ensure that the blood pressure is not elevated too greatly. It can be discontinued as soon as the circulation is stabilized.

Following operation oxygen therapy is of advantage; it should be continued until the pulse rate is stable. Care must be taken in handling and posturing these patients.

Spinal anaesthesia can safely be given to the majority of these patients provided the dermatome level does not encroach too highly upon the sympathetic outflow. Provided, too, that the other principles mentioned are not omitted. For those familiar with regional anaesthetic procedures when such is indicated and undertaken oxygen administration and vasoconstrictor support must not be forgotten.

Epinephrine is better replaced or omitted from the solution used.

*Anaesthesia for intestinal obstruction.*—These cases often present problems. These are too lengthy to discuss in detail here. The main factors to bear in mind are: the degree of hydration, and the replacement of fluid and salt. The ever-present possibility of silent vomiting must always be borne in mind.

*Anaesthesia for Cæsarean section.*—Cases of election do well under spinal anaesthesia following premedication by atropine alone. After the birth of the baby the patient may comfortably be put to sleep with pentothal. Where there is hæmorrhage or danger of hæmorrhage cyclopropane and oxygen, or ether and oxygen, administered after the patient has been prepared for operation are wise choices. Severe toxæmias can be beautifully controlled by a continuous spinal but if this is not possible, a general anaesthetic with abundance of oxygen should be given.

*Anaesthesia for tonsillectomy.*—It is considered by us that the advantages of endotracheal anaesthesia far outweigh its disadvantages. Following the operation certainty must be made that there are no postnasal or other packs inadvertently left behind. Postoperative posturing is of importance.

*Anaesthesia for hernia and appendix.*—For these relatively minor and short operations it is considered by us that a simple general anaesthetic is that of choice.

Before terminating it is desired that four principles be left for your consideration.

1. Never administer an anaesthetic unless fully prepared for any eventuality.
2. Suit drugs and method to the individual case.
3. Always have oxygen and a bag at hand during spinal anaesthesia.
4. Always observe the patient concerning blood pressure, pulse, respiration, temperature, and fluid therapy.

## CASE REPORTS

## OMPHALOCELE

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AT THE FOURTH WEEK of intrauterine life the greater part of the midgut is extruded from the main abdominal cavity by the rapid increase in size of the liver and other organs and the midgut thus lies in the umbilical cord. When the midgut fails to return to the abdomen the condition known as omphalocele results and normal rotation of the gut cannot occur. Specht and Shryock<sup>1</sup> state that "the most commonly accepted explanation is that there exists a disproportion between the abdominal viscera and the abdominal cavity. This disproportion usually results from a retarded development of the abdominal parietes".

It is generally accepted that surgical repair should be carried out on the first day of life preferably a few hours after birth. Conservative treatment by application of dusting powder and alcohol compresses followed by strapping has apparently occasionally been successful according to Gross and Blodgett.<sup>2</sup> But almost all cases die within a few days unless operation is performed. Death results from rupture of the sac and evisceration or from infection and peritonitis.

This case is reported for the following reasons:

- (1) Because it represents survival of a case of omphalocele with most of the liver in the sac, first operated on forty-three days after birth.
- (2) The development of bilateral inguinal herniæ immediately after the first operation providing

extra room for the viscera contributed greatly to the survival of the child. (3) Repair of the ventral hernia when the child was 10½ months of age was followed by a marked increase in the size of the inguinal herniæ. This release mechanism probably ensured the success of the ventral hernia repair.

L.R.W., a five weeks' old male infant was admitted to St. Paul's Hospital, Saskatoon, in April 1949 for repair of an omphalocele. The infant was full term normal delivery. Birth weight was six pounds nine ounces. The pregnancy had been uneventful and the family history negative. A large omphalocele covered by a shiny translucent membrane through which loops of bowel were visible was present at birth. The omphalocele was treated conservatively and although the child did not gain weight his general condition was fair.

On admission to hospital the infant was poorly nourished, weighing six pounds one ounce. The main finding on physical examination was a large omphalocele 9 cm. in diameter with a maximum protrusion above the anterior abdominal wall of 7 cm. The umbilical scar was evident at the centre of the protrusion. Healthy skin extended beyond the edges of the hernial sac. The hernial sac was covered by a thin reddish membrane on top of which there was a fine film of purulent exudate. The recti were markedly separated. Other abnormalities noted were: an abnormally high hard palate; the right fifth finger was deformed at the metacarpo-phalangeal joint; the right testicle was ectopic and a hydrocele was present on the left side.

**First operation.**—On the fifth day after admission (43rd day after birth) under open ether the first stage of the repair of the omphalocele was performed by the late Dr. R. H. Macdonald. At operation the transverse colon, part of the stomach, small bowel and practically the whole of the liver were noted in the sac. These organs were returned to the abdominal cavity. However it was impossible to approximate the recti. Without undercutting the edges, the skin was brought together with mattress wire sutures.

The microscopic description of the hernial sac is as follows: "Much of the cutaneous surface is ulcerated and covered by a thick slough of purulent exudate and necrotic tissue debris. Beneath this there is an exuberant granulation tissue proliferation with much chronic inflammatory reaction. The corium is scarred and similarly inflamed with many new vascular channels. The inflammatory reaction even spreads into the adherent adjacent peritoneum in which there is much fresh hæmorrhage".

Immediately following operation both limbs and the lower abdomen became markedly cyanosed. Heparin was started and the limbs elevated. Cyanosis disappeared in about forty-five minutes but a pitting oedema of the thighs and legs persisted for six days. A stormy post-operative course followed. With oxygen, intravenous fluids, antibiotic therapy and a gradual resumption of feedings the general condition of the infant improved slowly. The improvement was aided by the development of bilateral inguinal herniæ on the fifth postoperative day. By August 1949 his general condition was good. He had two large reducible inguinal herniæ which were controlled by trusses. The patient was discharged to return later for repair of the ventral hernia.

**Second operation.**—January 27, 1950, age 10½ months, repair of the ventral hernia by one of us (J.E.L.). Under ether anaesthesia, a vertical elliptical incision was made, encircling the hernia in the epigastric region. The viscera were covered by peritoneum and skin only. The anterior and posterior rectus sheaths and peritoneum were identified on both sides and repair was commenced. The peritoneum and posterior sheaths were brought together



Fig. 1

Fig. 2

Fig. 1.—Forty-three days after birth. Fig. 2.—Age 1 year.

in the midline with No. 1 chromic catgut interrupted sutures. The anterior sheath was sutured with interrupted 00 black silk sutures. Vertical Mattress 000 silk sutures were inserted for skin closure.

The postoperative course was generally good but it was noted that immediately after the operation the bilateral herniæ increased greatly in size and that they contained bowel.

*Third operation.*—February 18. A large indirect right inguinal hernia with a thick-walled sac was isolated. This was repaired in standard fashion. It was noted that the testis was lying in an ectopic position in the subcutaneous tissue just below the inguinal ring.

*Fourth operation.*—February 24. A large indirect left inguinal hernia was repaired. A large hydrocele was also repaired. On discharge from hospital two weeks later all wounds were healing nicely. Six months later the child was seen again and the repair of the omphalocele was considered to be quite satisfactory.

#### SUMMARY

A case of omphalocele, containing almost all the liver, is reported. This case was operated on 43 days after birth. Skin coverage of the viscera was obtained at the first operation and 10½ months later repair of the ventral hernia was completed. The rôle of the inguinal herniæ in providing much needed room for the viscera is stressed.

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### INTRAPLEURAL THYMIC TUMOUR IN MYASTHENIA GRAVIS\*

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THE PERSISTENT or enlarged thymus associated with myasthenia gravis is usually situated in the superior mediastinum and projects up into the neck, or more commonly down into the anterior mediastinum, depending on the degree of enlargement. Because of the recent interest in thymectomy as a treatment for myasthenia gravis and because no similar cases have been reported, we are presenting a case in which the enlarged thymus was suspended in the right pleural cavity.

#### SUMMARY OF CLINICAL HISTORY

This 46 year old farmer was in excellent health until three months before death when he developed weakness and clumsiness of the hands. A few weeks later, the weakness spread to his arms and shoulders. One month before death, the strength in his hands returned to normal, his arms improved, but his shoulders remained unchanged. About this time he noted difficulty in holding his head erect, and progressive difficulty in swallowing.

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Two weeks later his face felt "stiff and hidebound"; mucus collected in his throat because of impaired coughing. In the week before admission to hospital, his voice became nasal and he had occasional transitory diplopia when looking to the left or right. There was no family history of musculo-skeletal disease.

Examination in hospital three days before death, showed a well built, sturdy man. The eye movements were full and there was no diplopia. There was a bilateral symmetrical upper and lower facial paresis. The pharyngeal reflexes were present but there was slight weakness of elevation of the left side of the soft palate. The voice had a definite nasal character. The sterno-mastoids were equally weak, but the trapezii were strong. The tongue could be moved from side to side, but could not be protruded beyond the teeth. He was able to shrug his shoulders, but there was marked symmetrical weakness of all other movements of the shoulders and elbows and upper part of the legs though distal power was preserved in all limbs. There was only faint excursion of the thorax, and fluoroscopy showed normal diaphragmatic movement. The rectus abdominis was very weak. There was no wasting, pseudohypertrophy, fibrillation, or disturbance of tone. The blood and cerebrospinal fluid were normal. A routine miniature chest x-ray taken on admission, but not read until after his death, showed an opacity in the right cardiophrenic angle.

A test dose of 0.5 mgm. of prostigmine was injected hypodermically. In about 15 minutes there was a slight lessening of the nasal quality of his voice, and a slight improvement in his ability to cough. The lower facial muscles were slightly stronger. There was no improvement of the upper limbs, sterno-mastoids, or muscles of the tongue. He was subsequently given four hypodermic injections of prostigmine, each being followed by the same slight transient improvement. About six hours after the last injection, he was seen by a nurse and was resting quietly. Three minutes later he was found dead.

#### SUMMARY OF AUTOPSY FINDINGS

There was no cyanosis of the body. An oval mass weighing 55 gm. and measuring 9 x 6 x 3 cm. lay in the right pleural cavity between the medial aspect of the right lung and the right lateral surface of the heart, approximately at the level of the minor fissure. The mass was suspended from the superior mediastinum by a tubular reflection of parietal pleura resembling a mesentery and containing an artery, two veins, and some fatty areolar tissue (Fig. 1). The tumour was pinkish-grey, soft, cystic and enclosed by a thin fibrous capsule. In the fixed specimen, the cut surface showed a granular, follicular parenchyma traversed by thin fibrous septa. The lungs were heavy, weighing 750 gm. each. Petæchial hæmorrhages and areas of bronchopneumonic consolidation were scattered through the lower lobes. The spleen was enlarged, weighing 325 gm. The cut surface revealed normal splenic tissue. The cerebral hemispheres were oedematous. A small grey nodule, 5 mm. in diameter, projected into the fourth ventricle from the superior medullary velum.

Microscopically, the parenchyma of the intrapleural tumour consisted of sheets and follicles of lymphocytes divided into lobules by fine fibrous trabeculae. Large pale epithelial reticular cells and well-developed Hassall's corpuscles were distributed evenly through the lymphoid tissue. The numerous capillaries and venules were distended by red blood cells. The appearance was that of a uniform benign hyperplasia of the thymus. Sections of the affected muscles showed small perivascular accumulations of lymphocytes. The small nodule projecting into the fourth ventricle was an astrocytoma. The cause of death was not determined.

#### DISCUSSION

The clinical diagnosis of the case was difficult. The facio-scapulo-humeral distribution of weakness, the absence of myasthenic reactions and

the escape of the oculo-motor muscles all obscured the diagnosis of myasthenia, and furthermore, prostigmine is sometimes able to strengthen the weak muscles found with brain stem tumours and motor neurone disease. The necropsy ruled out any organic cause for the muscle weakness and the combination of thymic tumour and lymphoid aggregates in the muscles makes the diagnosis of myasthenia almost a certainty.

The relationship of the thymus to myasthenia gravis has been reviewed by Bell,<sup>1</sup> Norris,<sup>2</sup> Blalock *et al.*,<sup>3</sup> and McEachern.<sup>4</sup> The general opinion of these authors is that the thymus is enlarged (including tumours) or "persistent" in about one-half of the cases of myasthenia gravis studied at autopsy. More recently, Blalock<sup>5</sup> and Keynes<sup>6</sup> have found, in carrying out thymectomies, that the thymus is invariably "persistent" in myasthenia gravis, but that tumours of the thymus are uncommon. There is still no real

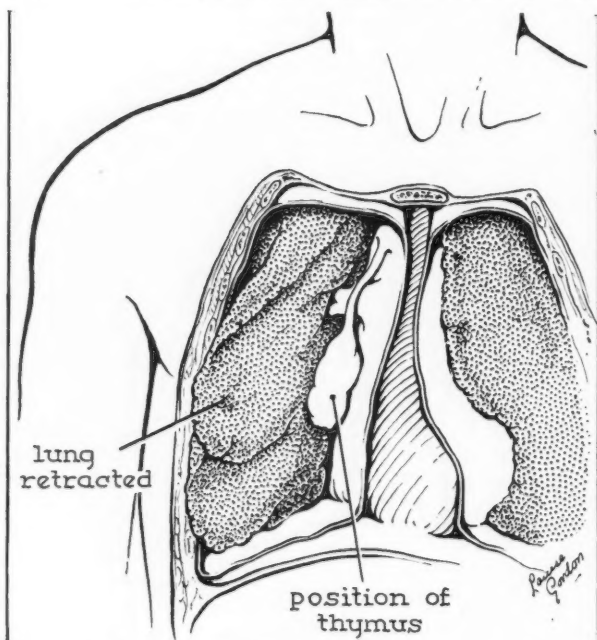


Fig. 1.—Drawing showing position of thymus at autopsy.

agreement as to the character or specificity of the lesions in the thymus but Norris' view,<sup>2</sup> that the most common finding is a benign hyperplasia of some or all of the cellular elements, is the most widely accepted. The case reported by Fershtand and Shaw,<sup>7</sup> in which myasthenia gravis developed after partial resection of a sarcoma of the thymus, illustrates the obscurity of the relationship between the thymus and this disease.

Although it is unusual for the thymus to be unilateral, complete atrophy of either lobe of

the embryonic thymus occasionally occurs (Schmincke<sup>8</sup>). In our case, the attachment of the mesentery of the thymus to the superior mediastinum indicates that the gland originally developed in the normal position. It is difficult to explain the intrapleural position on the basis of any developmental abnormality.

The epithelial elements of the thymus arise from a fusion of the ectodermal cervical sinus, a tubular pouch of the third branchial cleft, and the third endodermal pharyngeal pouch. The epithelial reticulum develops from the endodermal pouch; the primitive thymic cortex and Hassall's corpuscles from the ectodermal cervical sinus.<sup>9</sup> Lymphocytes invade the gland later with the ingrowth of connective tissue cells and capillaries. In some mammals the thymus develops from the fourth branchial complex and it is believed that this may occasionally apply to humans.<sup>8</sup> In the human embryo the laryngo-tracheal ridge, which gives rise to the larynx, trachea, bronchi, and lungs, forms in the mid line at the level of the fourth pharyngeal pouch. However by the time the ectodermal and endodermal derivatives of the thymus break free from the cutaneous and pharyngeal surfaces (12 to 19 mm. embryos) the lung buds have taken up their position in the thorax and have attained a comparatively advanced degree of development, so that it seems unlikely that the intrapleural descent of the thymus can be related to the growth of the lung buds.

#### SUMMARY

1. A case of a hyperplastic intrapleural thymus associated with myasthenia gravis is presented.

2. The attachments of the mesentery, and the blood supply of the thymus indicated that the gland was originally situated in the superior mediastinum. The forces responsible for its descent are obscure.

The authors are indebted to Dr. J. Allan Walters of the Toronto General Hospital for permission to publish this case.

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## OCCUPATIONAL DERMATITIS DUE TO ONION AND GARLIC

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OCCUPATIONAL DERMATITIS due to members of the Allium family (the common onion, allium cepa, and garlic, allium sativum) is very unusual and therefore merits this report. No cases seem to have been reported in the literature.

A.P., age 30, a cook for the past four years, was seen in September, 1951, on account of an eruption involving the tips of all fingers and thumb of his left hand and slightly on the palm extending to the wrist, of one year's duration. The lesions were demarcated hyperkeratotic areas with fissuring, and there was an added vesico-pustular infection which made his work difficult. His palms perspired abnormally. On account of this added infection, terramycin was given along with fractional x-ray therapy to the areas and local compresses. At the end of three weeks, the hyperkeratotic areas alone persisted, which were still fissured and painful.



Fig. 1.—Allium dermatitis, showing distribution of demarcated hyperkeratotic areas.

On looking for the cause of a unilateral dermatitis with this unusual distribution, his job with its possible contacts was investigated. In his handling of vegetables, attention was drawn to garlic and onions. In his work, he was accustomed to holding an onion or garlic with the tips of the fingers of the left hand and cutting it with a knife held in his right hand. A large onion would contact the palm.

As a result of this enquiry, he was asked to refrain from handling garlic and onions and within ten days a definite amelioration was apparent, at which time the photograph was obtained. He cleared up shortly thereafter.

At this time patch tests were done with small pieces of common onion and garlic. Within 48 hours there was an oedematous, raised, and erythematous reaction to garlic. A reaction to onion was apparent in the form of raised erythematous papules. Both of these reactions were accentuated at the end of one week and accompanied by itching and burning. The reactions, though subsiding, were still very evident at the end of two weeks.

A scratch test was also done, applying raw onion and garlic to the areas. Within twenty minutes, a pronounced flare was present with a minimal central wheal.

### SUMMARY

A case in a cook of occupational dermatitis to members of the Allium family (common onion and garlic) acquired by contact is reported. The peculiar distribution of the eruption might serve in the elucidation of other cases.

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## SPECIAL ARTICLE

### THE EMERGENCY FOR RESEARCH IN UNEXPLORED FIELDS OF PUBLIC HEALTH\*

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[We are glad to republish, by the kind permission of the Editor of the Canadian Journal of Public Health, the following paper by Prof. E. G. D. Murray.

\*Presented at a general session during the thirty-ninth annual meeting of the Canadian Public Health Association held in Montreal May 28-31, 1951, in conjunction with the annual meeting of la Société d'hygiène et de médecine préventive de la province de Québec.  
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*Professor Murray writes too seldom, and his soundly matured judgment should receive our close attention.—EDITOR.]*

IT IS EVIDENT that the title I am to speak to is fantastic for a paper to be covered in a few minutes. It was chosen for me, and I have left it untouched, because, it seems to me, the ratio of this title to what I can do with it is somewhat in the same proportion as is the existing need for research to what we are able to do. I propose to contend that the need for research today is every bit as great and every bit as urgent as it ever has been in spite of the wondrous and prodigious progress that has been made in the past century.

I suppose everyone will admit that research is necessary, but I think it is important to be sure of what we mean by research. Few will

disagree with the definition that it is the accumulation of accurate knowledge by investigation, though some pedants may insist that the investigation must be by verifiable experiment, which is no more than a special case. So far we are on safe ground and like all forms of security it is tediously dull. It used to be thought that research ability was gifted to the select few who were only fit to become one of those queer fish known as Professors. Those were the happy days, before the politicians realized that there is power in science and its applications, since when scientists have to a large and disquieting measure become enslaved and science is to some degree perverted to political expediency.

So it has come about, that, by exploiting the poverty of the laboratory, and through a misunderstanding of the purpose and urge of scientific investigation, the perfunctory way to achieve research is to provide grants in aid. I will not now pursue the evil potentiality of this concept as it is metastasizing in the budgetary policies of universities and perhaps restricting the function of other laboratories.

The concept is manifestly wrong. Research is still, and ever must be, an individual capacity and a personal absorbing enthusiasm. Work of the highest calibre, such as is important to produce, cannot be achieved by the "young man in a hurry" working merely for an easy living from nine to five and pressed by his superiors to produce two or three papers a year. The need is to select, train and encourage those most suited to the purpose.

Money should be distributed as block grants to laboratories under proved leadership, and only exceptionally to individuals. From such centres will then come those that public health laboratories need and should desire, with the qualifications and training to undertake the problems urgently requiring solution. If public health research is to be what it deserves to be, its first essential need is the best possible workers in all the diversity of its interests.

Having got the men, the first major difficulty is overcome and they are relatively easily provided with the necessary equipment and facilities, not neglecting to allow adequate time for the purpose.

The second major difficulty is to recognize and clearly define the problems they have to solve, and this is vastly more troublesome to do than the inexperienced realize. We all have a tendency to confuse our thinking by accepting some obscure word or phrase and this often turns us from understanding a situation. As an example, I think you and I know better what is meant by "Public Health and Hygiene" than we will ever understand from "Health and Social Medicine". We can so wrap up a problem in a high-sounding phrase that it becomes lost to view. Sometimes, when we give a name to a disease or coin a term for a train of circumstances, there is a tendency to think the problem is solved. In the course of

about 35 years of teaching, I have learned never to use a technical term without defining its meaning, unless I were foolish enough to wish to hide my ignorance from the students.

To illustrate what I mean, I submit we are deluding ourselves when we give definite meaning to names of diseases of which we do not know the cause and in so doing we hide the urgent problem of discovering the cause. A most excellent example of deluding ourselves is the word "epidemic". We each of us think we know what we mean by it and it is not uncommon, when some disease is more than usually frequent, for its incidence to be authoritatively pronounced an epidemic or not an epidemic. Yet, and I say this with knowledge and experience, there is not one of us knows how to produce an epidemic with certainty, using what we will how we will. The complexity of factors involved in the development of an epidemic are, up to now, only dimly perceived by any of us. Still it happens that gigantic epidemics have been traced in the past to unbelievably small beginnings and their development and spread has proceeded with appalling and abrupt disaster. Here is a subject for research and one that can matter at any moment, but it is a complexity of problems, each of which must be clearly envisaged and finally co-ordinated in the light of certain knowledge.

This is not the occasion for me to list the infectious diseases whose cause we do not know, nor those whose method of spread has not been determined. Unsuspected diseases are discovered surprisingly where they were not anticipated to exist. The influences of environmental and circumstantial contributors to ill health of all kinds are only beginning to be given significance. Vast fields, involving living beings other than man, as reservoirs, as vectors, and as susceptibles, have yet to be explored. The complexities of enzyme systems and hormone systems are rapidly assuming absorbing interest. These are no more than a very few instances indicating the need, and, the truth of the matter is, every little accretion of knowledge opens wide and deep possibilities of research, if we have the prepared understanding to recognize them. I am personally too limited in my knowledge to picture for you the future of public health, but there is an infinity of problems, and much to learn of all of them; and that means research. It must be enlightened research by the best brains we can find and encouraged by appreciation.

There is an urgent matter which I believe should engage our attention as it is bound to become of tremendous public health importance. Research has brought into use drugs and products of living cells which are becoming increasingly prominent in the management and treatment of diseases. Many of these are bringing about astonishing modifications of previously existing conditions, to such an extent that the use of these substances requires more care than

has been accorded them up to now. We are beginning to recognize that antibiotics are not uniformly without their dangers and disadvantages, great as have been the benefits their use has conferred. This is not simply a clinical therapeutic problem of individual cases, but has public health significance. Witness the interference with the production of immunity in typhoid fever cases treated with chloromycetin, resulting in an unprecedented frequency of relapses and retained susceptibility to reinfection, without any reduction of the carrier rate. Its extensive use in an outbreak of typhoid might well give rise to unprecedented problems in the management of the public health situation. Another type of antibiotic problem comes from the justifiable and intensive use of an antibiotic to treat one kind of infection, thereby promoting the development of another and different kind of infection. This is illustrated by the development of serious mycotic disease, for example, when aureomycin is used extensively to treat a susceptible bacterial infection. Indiscriminate use of antibiotics is also inducing astonishing changes in regional bacteriology which are at times detrimental to the patient.

Even the widening use of hormones of the ACTH type may impinge on public health in unexpected ways. Besides the seeming generalization of a bacterial infection in the treated patient, without giving rise to concomitant symptoms, there is increasing evidence to indicate the suppression of the production of immunity when these hormones are used. Who knows what this might lead to? These recitals of adverse effects and interference with results on which public health measures have been based, indicate at very least that care and control are desirable. More than that, they indicate an emergency for research to provide a basis for controls.

Besides this cautionary attitude to antibiotics, based upon certain disadvantages, I wish to draw attention to what I have thought up as a progressive beneficial possibility. The process by which the sulfonamides and antibiotics have reduced the incidence of lobar pneumonia, in the course of effective treatment of cases, is not clear by any means. It is a most important question to investigate, for immunization failed to bring it about. It may be said, what does it matter now that it is done? Well, apart from the aggravation of not understanding why and the how, it has a promise in what is possibly still the most urgent need in public health today, control of tuberculosis.

True, the tuberculosis rate is still steadily falling in all-well conducted communities, with certain exceptions, such as in the American Negroes, but there must be a limit to the influence of hygiene in that regard. If the effect of adequate treatment on the incidence of pneumonia could possibly be reproduced in tuberculosis, our public health approach to that disease must first be fundamentally changed.

Although, admittedly, there is a growing respect for BCG and some attention is being given to other possibilities, such as using the Vole bacillus, I believe it is essential to do something more than induce a partial immunity in order to gain complete control over tuberculosis. To this end it seems possible that the lesson of pneumonia indicates that adequate bactericidal treatment of cases, particularly in regions where the tuberculosis rate is now greatly reduced, might give the *coup de grâce* with great effect.

The principle is straightforward but its application presents a variety of difficulties. I firmly believe it is urgently necessary to lay the greatest possible stress on the earliest possible diagnosis of tuberculosis and with that to emphasize the extensive use of streptomycin, and any other effective or ancillary drug, as early in the disease as we possibly can. If streptomycin can do such a marvel as it does in tuberculous meningitis, it must be capable of even better in very early cases of more ordinary kind. It is important to anticipate fibrosis, cavity formation and the development of lesions to a degree when they come within the range of first detection by x-ray examination. Such a stage I regard as late. Herein largely lies the change required in the public health approach.

This becomes a straight applied bacteriological problem. I have known several instances of the finding of tubercle bacilli, by infinite care, when neither x-ray nor physical examination could detect anything in the case. There is need for research to improve and develop methods of diagnosis and in conjunction with this to promote co-operation with the laboratory on the part of clinicians and public health authorities. This leaves me to deplore the inadequacy of the so-called laboratories in many sanatoria and tuberculosis hospitals. It would seem that the laboratory is commonly the last and least to be considered in designing a tuberculosis service. To achieve what I believe is possible, this situation must be profoundly altered. Of all diseases, there is none more emphatically the concern of the bacteriology laboratory than is tuberculosis. It seems to me reasonable to expect that early diagnosis with adequate bactericidal treatment will not only benefit the individual patient but will bring the incidence of tuberculosis to compare with the incidence of lobar pneumonia at the present time in many places.

These observations bring out that the emergency for research is still just as great in a number of the old fields as it may be in any new field. As for unexplored fields, we need not leave our own doorstep to find them.

The public health laboratory has vast and urgent fields to investigate, and, besides providing for its prescribed routine control tests, it must be designed to do research. I often wonder why the public health laboratory is doing its utmost to creep into the field of hospital and

(Concluded on page 308)

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*(Information regarding contributions and advertising will be found on the second page following the reading material.)*

## Our late King and Patron

All members of our Association will share in the general mourning at the death of King George VI, our Sovereign and Patron of our Association.

The gravity of his illness last fall was only too apparent, in spite of the very proper reticence of his medical advisers in the official technical accounts. The relief in our minds following His Majesty's very satisfactory postoperative progress, was of course tempered with the natural suspense associated with such cases. But no one expected the sudden tragic outcome.

The affection in which the King was held by so many depended on the fine personal qualities which distinguished him so wonderfully. Our loss is very great. How much more poignant is the sorrow of his family. Our deep sympathy and respect go out to them in their grief.

## EDITORIAL

### ACUTE IRON POISONING IN CHILDREN

The use of iron in the form of ferrous sulphate is so widespread, of such long standing, and generally so free of dangerous effects, that its toxic capacities are apt to be overlooked. But in recent years reports have accumulated on acute iron poisoning from ferrous sulphate tablets. These were all in young children, and they are worthy of attention as another hazard in the home.

That iron in large amounts is poisonous is of course quite well recognized. But to some extent its poisonous effects are usually obviated by the irritation produced in the gastro-intestinal tract by amounts large enough to be poisonous. Hence, if it were to be taken by an adult in overdose it would not be at all likely to be fatal: certainly it would not be the agent of choice in suicide.

In very young children however with their tendency to swallow anything that can be swallowed, especially if it is attractive in colour and taste, as these tablets are, there is often the possibility of several ferrous sulphate tablets being swallowed. The consequent effects of vomiting and diarrhoea occur as in the adult, and in some cases this gets rid of enough to prevent poisoning. But enough may still be absorbed to cause death.

Spencer<sup>1</sup> gives details of four fatal cases in infants, due to swallowing of ferrous sulphate tablets. The ages varied from 12 to 18 months. The quantity of iron swallowed could not be accurately estimated in each case: in two it was probably very large—about 40 tablets. He also describes four cases of this type of iron poisoning, treated successfully in his hospital, even though the amount of iron taken was enough to cause fatal results.

Thomson<sup>2</sup> also reports six cases of ferrous sulphate poisoning in very young children, of whom two died and Forbes<sup>3</sup> and Prain<sup>4</sup> two more. It is certain that there are cases of children swallowing these pills which are not reported because vomiting removes the iron in time to prevent absorption. Even fatal cases may not be recorded.

It is not clearly explained how iron brings about either the initial irritative effects on the stomach and to a lesser extent, on the intestine;

or the later collapse and death. The nausea, and vomiting—often hæmatemesis—seem to be due to direct irritation of the mucosa, but we do not know the exact mechanism of this irritation. The later effects follow on the absorption of the iron from the injured gastric mucosa. The serum iron was determined in two of the non-fatal cases in Spencer's series and was found to be very high, of the order of 3.3 and 3.4 mgm. % (normal—0.035 to 0.22 mgm. %). The autopsy findings have not usually shown enough gross tissue damage in the liver or other organs to account for death. There were two critical periods in the fatal cases; the first after 4 to 6 hours, when three children died, and the second from 20 to 23 hours, when five died. The first may be accounted for by the initial shock of the damage to the stomach. These symptoms may pass, leaving a deceptive improvement, but with the serum iron reaching very high levels fatal effects develop. Since the gross pathological changes seem insufficient as a cause of death, it is possible as stated by Cameron<sup>5</sup> that "precipitation of iron particles in the blood may lead to multiple pulmonary and systemic emboli with symptoms like those of fat embolism". The effects of large quantities of iron on the blood itself have yet to be worked out.

Treatment is based mainly on getting rid of the swallowed material as soon as possible. Vomiting should be induced or encouraged, followed as soon as possible by gastric lavage with sodium bicarbonate or bismuth carbonate, both of which form the less toxic ferrous carbonate. Intravenous glucose saline may be considered later on. In view of the deceptive interval period of apparent well being it is wise to admit the child to hospital as soon as the poisoning is recognized, for observation and possible further treatment. Shock may be treated by usual methods: plasma or its substitutes such as dextran, and transfusion for whatever bleeding may occur. Loss of fluids and electrolytes should be made good by intravenous methods. Antibiotics are a valuable precaution in warding off the broncho-pneumonic complications which are frequent in all poisonings.

In any case, the danger of these iron tablets for children should be well understood, and as careful precautions taken to keep them out of reach of infants as in the case of any other poison. Spencer reflects plaintively that it seems somewhat irrational that what children should

take remains unpleasant, *e.g.*, codliver oil, whilst iron containing tablets meant for adults only, should be made so attractive in taste. But, eternal vigilance is still the price of safety.

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## Editorial Comments

### BREAST-FEEDING

Breast-feeding, like many other things, waxes and wanes in popularity. It was fashionable during the eighteenth and nineteenth centuries. It was unfashionable at the commencement of this century and wet-nurses became almost unknown. Borden was granted a patent for the manufacture of condensed milk in 1856 and in 1925 when the widespread commercial processing of milk was perfected and advertisements advocated artificial formula-feeding, breast-feeding again decreased in frequency. Since 1925 formula-feeding has been almost as popular as breast-feeding, recently, however, there has been a marked swing back to the method of Mother Nature. Breast-feeding is of optimum advantage to the infant both physically and emotionally; it should be advised in all cases where a mother is physiologically capable of nursing her child.

Today, it is true, artificial formulæ may be made in practically all respects similar to breast milk. Studies show that those children who are artificially-fed require nearly five times as many domiciliary visits for illness as those who are breast-fed for more than three months. There is a much higher incidence of contagious disease and eczema is seven times more common in formula-fed infants. Many pædiatricians state that by looking at a young child they are able to say whether it was "bottle-fed" or "breast-fed".

A warm relationship between mother and child is very important, but is it true that this desirable warm relationship can always be attained through breast-feeding? The desired relationship between the mother and child will be gained only when breast-feeding is an experience of mutual satisfaction both to the mother and the infant. In many cases the pædiatrician plays the deciding rôle in emphasizing the importance of breast-feeding. If a mother is in doubt of her ability to provide an adequate flow

of milk, the reassurance of a doctor in whom she has confidence will usually calm her fears and breast-feeding will be successful. It is emphasized that the nursing situation must be one of mutual satisfaction, and if so, then the mother feeds her child with her mind through her breast. A mother who desires to nurse should be given every encouragement and opportunity to do so. The advantages of breast-feeding are numerous and the practice should be encouraged whenever and wherever possible.

J.A.S.D.

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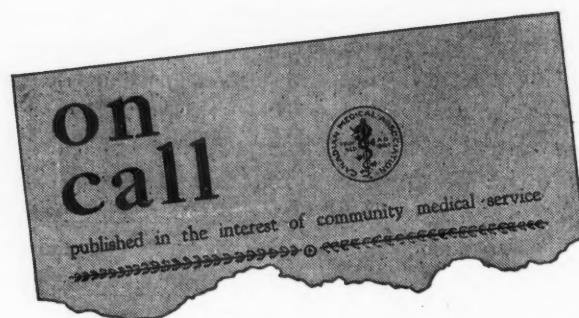
## MOTOR VEHICLE MORTALITY

It seems to us that any safety program to curb the rising death rate from motor vehicles must be carried out along several lines. Good highways for example are desirable, although there are figures that the accident rate has actually risen on highways of the most modern design. Closer control of the issuing of licences should be enforced. Inspection of vehicles might be introduced. All these things mean expense and additional controls, but motor traffic is inextricably bound up with modern civilization and must be faced as an urgent, inescapable problem. This is something in which medicine can do little but salvage injury, unless it be, as citizens, to warn and exhort.

These reflections are all the more pertinent when one reads of the lowering of death rates in Canada from almost every other cause except motor vehicle accidents.\* The tuberculosis death rate is at a new low in 1951; in only five years the rate has been cut in half. Maternal and infant mortality shows a highly satisfactory record. Diphtheria is a minor factor in infant mortality now. Chronic diseases of the circulatory system and kidneys, as well as diabetes show a lower rate than in 1950.

The death rate from cancer on the other hand has risen slightly. Here, however, we are dealing with an unknown cause. With motor vehicles there are many contributing factors, but, at least, they are clearly understood. It would seem that human behaviour, under given conditions, is just as difficult to regulate as cancer is impossible to control at present.

\*As reported in the Metropolitan Life Insurance Co's. records for 1951.



## "THE EDITOR AND THE DOCTOR"

This interview is the third in the series devoted to impressions of the medical profession by laymen. Robert A. Farquharson was recently appointed editor of *Saturday Night*. A newspaperman for 34 years, he was managing editor of the *Toronto Globe and Mail* for 10 years preceding his recent appointment.

Mr. Farquharson's long-standing interest in the medical profession is both personal and professional. He has been asked, in this interview, to concentrate on those areas of the doctors' public relations where he feels improvement is needed.

"The average patient feels his own doctor is a wonderful person yet at the same time is suspicious of the medical profession as an organized body and would not believe the evidence under oath of a doctor testifying on behalf of another doctor. The old general feeling that medicine was a dedicated profession finally disappeared when doctors headed the list of money makers in Canada. If the public's confidence in the profession as a whole is to be restored the doctors should take the initiative—and one way to start is by building a basis of trust between the press and the profession."

This is the opinion of R. A. Farquharson, editor of *Saturday Night*, who has been a frequent writer on medical subjects and has a wide connection in medical circles.

"I fully realize that doctors have suffered repeatedly from inaccurate reporting but doctors themselves have made this situation worse by their wariness in dealing with the press because of a misdirected application of professional ethics."

If the public is to understand the doctor's problems, the doctor must be more co-operative with the newspapers. "Many a reporter has phoned a doctor to check a story and had the doctor not only refuse comment or assistance, but hang up. This attitude is not only bad public relations, but is completely unnecessary. I know one doctor who for years has been patiently explaining medical subjects to reporters and magazine writers and he has never yet been quoted and never been embarrassed by a story."

"I can quite understand that doctors have been seriously embarrassed by being quoted. I have

heard one doctor say to another 'You wouldn't be advertising, would you doctor?' The remark may be a joke but there's usually an edge to it."

Fair and accurate coverage of medical news "works both ways, of course", Mr. Farquharson said. "I would like to see newspapers have medical reporters but the average newspaper in Canada has not a large enough staff to assign one man to specialize in medical news."

Stressing the continuing interest of newspapers in medical stories, Mr. Farquharson said they have "higher reader interest than everything except sex and sensation". But the difficulties of doing a good job of covering medicine can be frustrating, he declared. "Doctors co-operate when it is in their interests but not so often when it is in the newspaper's interests. When hospital campaigns come along the doctors open up wide but usually the co-operation ends when the campaign is over."

Mr. Farquharson pointed out that there has been improvement in relations between doctors and the newspapers and both can share in the credit. For example, doctors in many centres have wisely set up panels whose members are available for assistance to the newspapers on medical stories. However, doctors are inclined to forget the progress the newspapers have made in medical coverage and the sense of responsibility a newspaperman applies to his work. "Some papers never allow the word 'cure' in a headline even though 'treatment' takes a lot more space." He added that newspapers are conscious of the problems of the "so-called new discovery stories". Newspapers need the doctors' help in putting them in perspective, and the help is often refused, he said. Public and press "over-enthusiasm turns the doctors away" from these stories.

For the editor who holds up on a story there are hazards that emphasize the importance of the doctor releasing the facts as quickly and completely as possible. "I knew about insulin a year before it became public. Another newspaper broke the story and we were scooped. Then Fred Banting phoned to ask my help in stopping the publicity. It was a rather disappointing experience for a young reporter."

Doctors are inclined to ignore the tremendous public interest in medical advances and sometimes even after medical associations have done their best to have reporters cover conventions there is a lack of co-operation between the speakers and the press. If medical papers are to be covered by reporters difficulties would be avoided if the significance of what was said was put in layman's language. It might help in general understanding if doctors would realize that the reporter is just as much a specialist in his profession as the physician is in medicine.

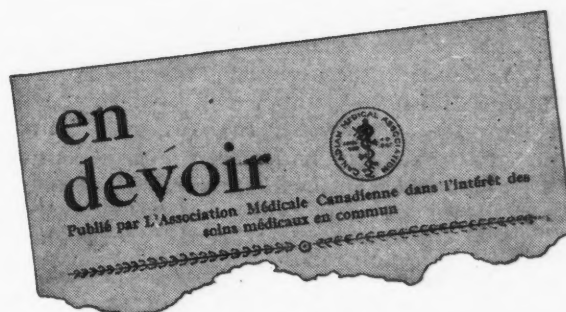
On the question of broad versus restricted prepaid medical care plans, Mr. Farquharson said: "I don't think that the health plans sponsored by the doctors have to cover all medical costs to prevent state medicine. I am prepared—and I

think the public is prepared—to pay normal medical bills but I would like to know that if there is a long, costly illness in my family I will have some form of catastrophe insurance."

Discussing national health insurance Mr. Farquharson said "politicians tend to be too optimistic about what can be done and paid for. As an editor I always want to see the costs."

"When the time comes for the profession to present its case to parliament on health insurance I hope it will be a moderate type of evidence. The stand doctors have taken in Britain and the United States has made the medical profession look like a tight labour union in the eyes of the public. Because of this and other factors, the doctors must be prepared to accept the fact that any effort by them to influence health insurance legislation will be suspect," he warned.

Mr. Farquharson advised doctors to devote constructive thought and action to the profession's public relations, beginning with the doctor in training. "I would like to see a course in public relations compulsory for medical students."



### "LE JOURNALISTE ET LE MEDECIN"

Cet article est le troisième d'une série qui transmet les impressions des profanes au sujet de la profession médicale. M. Robert A. Farquharson fut récemment nommé rédacteur en chef de *Saturday Night*. Journaliste depuis 34 ans, il fut rédacteur gérant du *Toronto Globe and Mail* pendant les dix années qui précédèrent sa récente nomination.

M. Farquharson a toujours manifesté un intérêt soutenu envers la profession médicale, aux points de vue personnel et professionnel. Au cours de cette entrevue, il lui fut demandé d'indiquer selon lui, les domaines où la profession médicale pourrait améliorer ses relations avec le public.

"Les patients en général ont beaucoup de respect et d'admiration pour leur médecin, mais en même temps, ils redoutent la profession médicale comme association organisée, et ne croient pas le jugement d'un médecin envers un autre collègue. Autrefois, selon la croyance générale, la médecine était une profession désin-

téressée, mais cette opinion est graduellement disparue depuis que les médecins sont en tête de la liste de ceux qui "font de l'argent" au Canada. Si la confiance du public envers la profession médicale doit être rétablie, il appartient aux médecins de prendre l'initiative—et l'un des moyens pour débiter dans ce domaine est d'établir une base de confiance entre la presse et la profession."

Voilà l'opinion de M. R. A. Farquharson, rédacteur en chef de *Saturday Night*, qui a écrit très souvent sur des sujets médicaux et qui possède de nombreuses relations dans ces mêmes milieux.

"Je réalise cependant que les médecins ont souvent subi l'ennui des reportages inexacts, mais ils ont rendu eux-mêmes cette situation encore pire par leur attitude de défiance envers la presse, par suite d'une mauvaise interprétation des directives établies pour la profession."

En vue de faire mieux comprendre au public les problèmes du médecin, celui-ci doit coopérer davantage avec les journaux. "Plusieurs journalistes ont téléphoné au médecin pour vérifier une nouvelle, et celui-ci refusa non seulement de donner les commentaires, mais ferma tout simplement le téléphone. Cette attitude non seulement nuit aux bonnes relations publiques, mais n'est pas nécessaire. Je connais un médecin qui pendant plusieurs années eut la patience d'expliquer des sujets médicaux aux rédacteurs de journaux et de magazines, et pourtant son nom n'a jamais été imprimé et aucun ennui n'a résulté pour lui parce qu'il avait eu la gentillesse de donner des renseignements."

"Je peux comprendre que certains médecins aient déjà été ennuyés parce qu'on avait cité leurs paroles et leur nom. J'ai même entendu un médecin taquiner l'une de ses collègues en disant: "Vous ne faites pas un peu de publicité, docteur?" Cette remarque est sans doute une plaisanterie, mais un peu désagréable quand même pour celui qui la reçoit."

"Des articles exacts et justes couvrant les nouvelles médicales auraient doubles avantages" ajoute M. Farquharson. "J'aimerais que les journaux possèdent des rédacteurs médicaux, mais le quotidien moyen au Canada, ne compte pas un personnel assez nombreux pour nommer un rédacteur spécialement désigné pour les nouvelles médicales."

Pour faire remarquer l'intérêt soutenu des journaux pour les nouvelles médicales, M. Farquharson affirme que "ce sujet est celui qui retient le plus l'attention des lecteurs à l'exception des articles à sensation ou concernant les questions sexuelles." Cependant, les difficultés pour accomplir un bon travail dans le domaine des nouvelles médicales peuvent être décevantes, déclare-t-il. "Les médecins coopèrent lorsqu'il s'agit de leurs intérêts, mais non lorsqu'il s'agit des intérêts du journal. Lorsque des campagnes pour hôpitaux s'annoncent, les médecins sont généralement très intéressés, mais malheureuse-

ment cette coopération se termine en même temps que la campagne."

M. Farquharson fait remarquer cependant qu'il existe beaucoup d'amélioration dans le domaine des relations entre la médecine et la presse, et toutes deux ont contribué à ce résultat.

Comme exemple, des médecins dans plusieurs centres ont fondé des cercles d'études dont les membres sont à la disposition des journaux pour donner leur aide dans la transmission de nouvelles médicales. Cependant, certains médecins ont tendance à oublier le progrès accompli dans ce domaine par les journaux et le sens de responsabilité que le journaliste applique à son travail. "Quelques journaux ne permettent jamais d'employer le mot "guérison" alors qu'ils appuient souvent davantage sur le traitement lui-même." Il ajouta que les journaux sont conscients des problèmes concernant les nouvelles couvrant les "soit disantes" nouvelles découvertes. Les journaux ont besoin de l'aide des médecins pour les éclairer à ce sujet, et reçoivent souvent un refus, ajoute M. Farquharson. L'enthousiasme du public et de la presse pour ces nouvelles semblent trop désintéresser le médecin.

Pour un rédacteur en chef qui connaît une nouvelle dans ce domaine, il existe des difficultés qui démontrent encore plus l'importance de savoir les faits aussi rapidement et aussi complètement que possible par les médecins. "Je connaissais l'insuline un an avant que cette nouvelle devienne publique. Cependant un autre journal publia la nouvelle avant nous, et je reçus alors un téléphone de M. Fred Banting qui me demanda d'aider à faire cesser cette publicité. Il s'agissait donc d'une situation plutôt embarrassante pour un jeune rédacteur."

Les médecins ont tendance à ignorer tout l'intérêt que le public manifeste à l'égard des développements de la science médicale, et parfois, même lorsque les associations ont fait leur mieux pour que des reporters assistent à leurs réunions, il existe un manque de coopération entre les conférenciers et la presse. Si un compte-rendu des conférences médicales doit être fait par les journalistes, des difficultés seraient évitées si l'explication de ces conférences était traduite en termes appropriés pour les profanes. Il existerait une plus grande compréhension générale si les médecins réalisaient que le journaliste est autant un spécialiste dans sa profession que le médecin dans la médecine.

Sur la question concernant les plans pour les soins médicaux payés d'avance, M. Farquharson énonça: "Je ne crois pas que les plans de santé soumis par les médecins doivent couvrir toutes les dépenses médicales afin d'empêcher la médecine d'Etat. Pour ma part, je suis prêt—et le public aussi, je le pense—à payer toutes les dépenses raisonnables pour les soins médicaux mais dans le cas d'une longue et onéreuse maladie dans ma famille, j'aimerais le secours d'une assurance qui éviterait une catastrophe."

En parlant de l'assurance nationale de santé,

M. Farquharson ajouta "les politiciens ont tendance à montrer trop d'optimisme à l'égard des résultats et des dépenses. Comme journaliste, j'aime toujours à analyser les chiffres et le coût.

"Lorsque le temps viendra pour la profession médicale de présenter son cas au parlement en faveur de l'assurance-santé, j'espère qu'elle le fera d'une façon modérée. L'attitude des médecins en Grande-Bretagne et aux Etats-Unis ont rendu la profession médicale aux yeux du public, comme une union ouvrière très fermée. Pour cette raison et d'autres, les médecins doivent être prêts à accepter le fait que tout effort de leur part pour influencer la législation à l'égard de l'assurance-santé sera redouté."

M. Farquharson conseille aux médecins de donner beaucoup d'attention et d'agir en faveur des relations de la profession avec le public. Cette attitude devrait même se développer chez l'étudiant en médecine. "J'aimerais voir un cours obligatoire en relations publiques pour tous les étudiants en médecine."

## MEN AND BOOKS

JAMES DOUGLAS, M.D.\*  
(1800 - 1896)

SYLVIO LeBLOND, M.D.,† *Quebec, Que.*

JUST A CENTURY AGO, James Douglas and Joseph Painchaud were the prominent medical figures in Quebec. A skilled surgeon, Douglas had practised at the Marine and Emigrants' Hospital for 19 years, building it up into a centre recognized throughout North America, where young men came to learn surgery with him.

He also taught medical students, as the "Ecole de Médecine de Québec Incorporée", of which Dr. Joseph Morrin was president, had arranged, three years earlier, for its practical lectures to be given at the Marine Hospital. Douglas, however, had retired from active practice two years before and, in addition to his duties at the Marine Hospital, he looked after the insane of the Beauport Asylum, which he had founded in 1845.

In 1851, as a result of an investigation held at the Marine Hospital, Douglas was suspected of being one of the instigators of the difficulties existing among the visiting doctors of the institution.

### EARLY YEARS

Douglas was born in Scotland, on May 20, 1800. His grandfather, an architect who had left his profession early, formed a friendship with John Wesley and became one of his followers.

\*Read before the Section of Historical Medicine, at the annual meeting of the Canadian Medical Association, Montreal, June, 1951.

†Chief of Service—Medicine, Quebec Veterans' Hospital.

His father was a Methodist clergyman. His mother, born a Roman Catholic, had embraced the faith of her husband, Rev. George Douglas, sharing in his ministry and in his work. Her name was Mary Mellis. James Mellis belonged to the Church of Scotland and his wife, Mary Stuart, was a Roman Catholic. They had two children: a son, who went to the Reformed Church with his father, and Mary, who attended Sunday mass with her mother. There was, apparently, little talk on religion at home. But love was more successful than much preaching and Mary became the loyal wife and assistant of Rev. George Douglas, the Methodist clergyman, whose faith and ministry she shared from their wedding day.

James Douglas was born of their union. Throughout his life and long medical practice in Quebec, where Roman Catholics and Protestants lived side by side, he showed much understanding and always respected the religious opinions of all. He admired his father greatly and, in his old age, still recalled their fishing trips to the rivers of Scotland. It did not become the minister to carry fishing equipment through the village. Therefore, the son would take some roundabout way with fishing tackle for two, while the father went through the village in his usual style, up to the brook side, where he hastened to shake off all decorum at the sight of a trout flashing in the sun, in the clear, cold water.

James was thirteen when he was articled for five years to Dr. Thomas Law, of Penrith, where his father was ministering. He liked the work and particularly Dr. Law. In his second year as apprentice, he was already of help. He could extract teeth, fill prescriptions, and bleed, thus providing for himself, since his fee for bleeding or removing a tooth was a shilling. After serving his five years' apprenticeship, he registered at the Edinburgh Medical School, and made the rounds of the masters whose courses he wished to attend, and enrolled. The only master who impressed him was Barclay, the anatomist, at times becoming so engrossed in his lectures that he would hold the lancet he used to dissect between his teeth while turning the pages of his book.

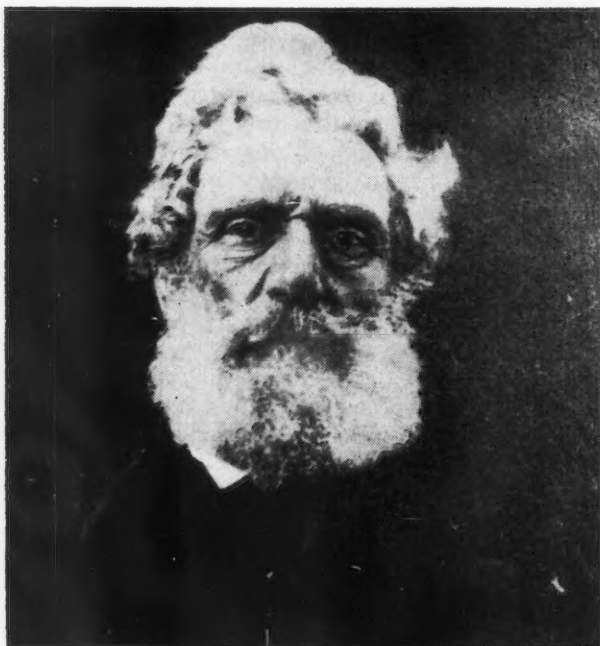
He did not complete his year in Edinburgh. Fond of adventures, he boarded a Spitzberg whale-boat as surgeon. Nineteen years old and strong, he was not afraid of assuming full responsibility for the health of fifty men. He was paid 4 guineas a month and was promised an extra guinea for each whale caught. His journey, which lasted from April 1 to August 21 1819, took him as far as latitude 80° North. The expedition proved a profitable venture and 21 whales were killed. Douglas kept a detailed diary of the expedition's doings, which he published in 1873, in the *Transactions of the Literary and Historical Society of Quebec*.

In the fall of the same year, he resumed his courses in Edinburgh. He often saw Liston and

Syme, his assistant, who had set up an anatomical theatre besides the official course given by Barclay. Liston made a strong impression on him, and he stated later that he learned surgery with Liston. On April 7, 1820, he was granted a diploma by the Royal College of Edinburgh. Then, he proceeded to London, his mind set on obtaining a diploma from the London Royal College of Surgeons. He went to Guy's and St. Bartholomew, attending the lectures of Abernethy and of Sir Astley Cooper. He was asked questions on the anatomy of the urinary system when he appeared before the examining board. On his twentieth birthday, Sir E. Balfour, the College secretary, handed him his certificate. A few days later, he was elected member of the Royal Jennerian Society and of the London Vaccine Institution.

#### IN INDIA

He had numerous family connections in India and this mysterious country appealed to him. He



Dr. James Douglas

enlisted as artillery medical officer in Dum-Dum. The journey lasted six months. He spent one year in India and came home, where he was immediately given a permanent appointment with the India Company. The return voyage also lasted six months. After ten days at sea, cholera broke out on board, among crew members taken out of hospital to embark, and two men died. Douglas learnt on this occasion that cholera is a contagious disease and that it may incubate for a rather long time.

Back in England, he forgot Eastern India. Honduras, along with the other colonies in Latin America, had shaken off the Spanish yoke. Many Englishmen and Scotsmen had taken part in the revolution and some of them strove to clear a

piece of land for themselves on this deserted, marshy soil. Among these was Sir Gregor MacGregor, who was in search of settlers for the Puyais estate, in Honduras. Douglas applied as surgeon for the settlement, sailed with the party on the Honduras packet in November 1822, and disembarked on the wild, swampy, inhospitable banks of the Black River in February 1823.

By April 25, all of the 220 inhabitants of the settlement, except nine, were sick with fever. Groups were repatriated to Belize, the capital. Among the last to go, Douglas fell sick on May 20. Evacuated to Belize, he recalls hazily that he soon sailed to Boston, where he lived at a Mrs. Wilson's, attended by Dr. Warren, to whom, he was to say, he owed his life.

#### IN THE UNITED STATES

After his recovery, he resolved upon sailing to England from New York. On board the ship from Boston, he met some people who insisted strongly that he visit the United States before returning home. In their company, he went up the Hudson as far as Albany, planning to proceed to Buffalo through the Erie Canal and thence to Quebec via the St. Lawrence. At Utica, the canal was blocked. He decided on remaining there pending the completion of repairs. At this juncture, an incident occurred which was to alter the course of his life. While making himself comfortable at the small town hotel, he was called upon by some local people who knew him for a surgeon to see a sick farmer. This man had fallen down on a fork and the handle had found its way into his abdomen. Douglas examined the wounded man and located the point of penetration in the left groin. There was no damage to the bladder and to the intestines. On the opposite side, he felt a bulging mass. He incised, removed the scraps of clothing which had gone through the abdomen with the handle of the fork, and the patient recovered.

Douglas thus built a reputation for himself and patients flocked to him. He settled down in Utica. In 1824, the Medical College of Auburn appointed him professor of Anatomy and Surgery. He soon met "the most amiable and the most talented young lady", Miss Williams, of Utica, and they were married in the spring of 1824.

His brother George came over from Scotland to join him and they set up a dissecting room on the first floor of James' office. The first "stiff" carried in was a negro slave who had belonged to Judge Kipp. The judge was about to order the arrest of Douglas when the latter went to the judge and, after pleading with him, was forgiven on the condition that he would not let it happen again. But he soon relapsed. The body of a prominent man of the community, who had died recently, was brought to him. While he was out visiting a sick man, a patient entered his home. Finding the door unlocked, he roamed through the house and caught sight of the re-

mains of his former employer. Upon his return, Douglas saw his patient, who told him of his surprise at meeting his deceased master. Douglas swore him to secrecy. But, fearing Judge Kipp's anger, he packed his things, jumped into his carriage and left for Canada, crossing the St. Lawrence on the ice at Ogdensburg en route to Montreal. Friends he had known in Edinburgh, Stephenson and Holmes, advised him strongly to remain in Canada and to set up in Quebec, where he arrived on a nice winter afternoon, on March 13, 1826.

#### IN QUEBEC

He succeeded in finding a comfortable house on Mountain Hill, settled down there, and waited for patients. At first, his practice consisted chiefly in answering calls from the numerous shipyards, the town's main industry. Soon afterwards, he resolved upon teaching anatomy to doctors and medical students and equipped a dissecting room in the cellar of his home. Dr. Painchaud then offered him an annex to his own home to organize a nice dissecting room, on condition that he and his son, a medical student, be allowed to attend the lectures. This room was used for several years.

Douglas was afforded an opportunity to demonstrate his surgical ability at the Hotel-Dieu, at Dr. Morrin's request. He performed quickly a skilled disarticulation of a shoulder under the eyes of a number of surgeons.

During the winter 1828-1829, he was taken with typhus and was on the verge of death. He recovered slowly, but his exhausted wife died, apparently from pulmonary tuberculosis, leaving him a daughter who also died shortly after, in childhood. He resumed his work and devoted himself more and more to surgery, operating chiefly on club-foot and cases of strabismus.

In 1831, cholera raged in England. The British government warned Canadian authorities to prepare accordingly. Skepticism was expressed in this country. The journey was too long and the epidemic could not survive such a distance. Douglas, who knew from experience and had witnessed the appearance of cholera on board his ship ten days after sailing for India, held a different opinion. He stated his views before a meeting of the Board of Health convened by Dr. Skey, Inspector of Hospitals in Canada. But skepticism still prevailed.

In April 1832, he detected the first case of cholera in a workman; he found two more cases in May. By June 8, the epidemic raged in Quebec. Douglas' experience was soon acknowledged and this brought him the fine practice of Quebec. The epidemic was terrible, taking, in Quebec alone, a toll of over 3,000 victims out of the then population of 30,000. Douglas was overwhelmed. He summoned his younger brother Richard from Scotland to help him. His other brother, George, who had joined him in Utica

in 1823, was appointed medical officer of the quarantine of Grosse-Isle when its doors opened, in the spring of 1833. The following winter was unusually mild and Douglas took advantage of this to go on a caribou hunt. A detailed description of this trip appeared in his memoirs and he kept most pleasant recollections of it.

In 1834 another cholera epidemic raged, just as terrible as that of 1832. Douglas had just moved from Mountain Hill to a new home on the Place d'Armes, the fashionable section of the town at that time, opposite to the Governor's palace.

The Marine and Emigrants Hospital had been built in 1832 for the purpose of sheltering and treating seamen and immigrants. Crowds of the latter flocked in each year from the British Isles. Large numbers were sick on arrival and room could hardly be found for them. There was the "Fever Hospital" of Pointe-Lévy, but only contagious cases were admitted and transport proved difficult. The Emigrants Hospital located in St. John suburb was also available. Yet it was unhealthy and the population of the adjoining wards, wishing for its removal, raised protests. But these hospitals were closed prior to the opening of the Marine Hospital, where patients could not be admitted before 1834. In the spring of that year, temporary hospitals had been built on the wharves, as the Marine Hospital took in its first cholera cases in July only, over a month after the epidemic had broken out.

Dr. Hall, chief medical officer of the Marine Hospital, died in 1837. Dr. Douglas was offered his post. Well aware that the situation was most confused, he showed hesitation. He accepted in the end, on condition that he be given full responsibility for the direction of the services and that he be allowed to share the duties and the remuneration with a fellow doctor of good standing. The Governor-General, Lord Gosford, appointed Dr. Fremont, an unknown well connected young practitioner. Douglas dissented. Dr. Painchaud was then chosen. Both men were to work together for many years, not always on friendly terms, yet always for the good of the patients. Young Fremont, rejected at first by Douglas, soon became his friend and chief assistant in his surgical work. They were even associated in the foundation of the Beauport Asylum in 1845.

As soon as he came into contact with the patients, Douglas organized medical training in co-operation with Painchaud. The Marine Hospital was to develop into an important surgical centre and a surgical school recognized far and wide, and, as one of the students, Dr. Worthington, was to say, "second to none on this continent". In 1848, it was the chief nucleus of the practical training school created by the "Ecole de Médecine Incorporée". With the Hotel-Dieu, it was used as a clinical teaching centre by the Medical School of Laval University from the time of its foundation in 1853.

In 1846, Douglas pricked his finger while operating. Lymphangiitis and septicæmia ensued and he was at death's door. Upon his recovery, he took an assistant, Dr. Racey, who was to succumb to the typhus epidemic of 1847. This proved a bad year for Quebec and doctors alike. A serious typhus epidemic raged in Canada, brought from Ireland by the immigrants, who died like flies. The quarantine was full of patients. Douglas, who had foreseen this epidemic, had opened a private hospital in Beauport for shipmasters and cabin passengers. With Dr. Racey he treated 165 patients there. His treatment was most simple: hygiene, cleanliness, ventilation, and plenty of fluids. He obtained the best results. In the same year 1847, bickering appeared at the Marine Hospital. Painchaud had succeeded in having his son appointed intern at the Marine Hospital. Douglas, who had supported another candidate, victimized Painchaud's son and made life a burden for him. This resulted in strained relations between the two associates. Exactions occurred shortly after at the Marine Hospital and, in 1851, the intern in surgery, Dr. C. E. Lemieux, filed an official complaint against Cutter, the superintendent. The commissioners held an investigation and Cutter was dismissed.

Prior to these events, six new visiting doctors had been appointed for the hospital. Douglas had viewed this fact as an encroachment upon his own reserved field. He gave a cold reception to these doctors, several of them friends of his, and oppressed them. His conduct in the course of the inquiry induced the authorities to believe that he was fanning the dissension. In 1852, a Royal Inquiry was ordered by Lord Elgin. The investigating members, Nelson, McDonnell and Perreault, acknowledged Douglas' surgical ability, but they blamed him for his rather tyrannical and dictatorial ways.

He left the Marine Hospital after the inquiry. Since 1850, he had suffered from a chronic disease of the respiratory tract, and he spent the winter season in Egypt or in South Italy. By 1849, his chief interest was the insane and he gave up his medical practice. He removed to Beauport, setting up his permanent home in "Glenalla", his villa, close to the building housing the insane.

Before him, the insane were kept and treated after time-worn methods. Confined to narrow cells about 9 x 9 x 9, they were allowed out only once a week, while the cells were cleaned. In the centre of the cell floor, there was a hole for excreta, and in the ceiling a small window to let in a dim light. As far back as 1824, a special committee headed by Mr. Richardson had been appointed by the Governor to investigate the situation regarding the insane in the Province of Quebec. This committee submitted an explicit report: the whole system had to be changed. But this recommendation remained a dead letter.

The government acted only in 1845, as a result

of the intervention of an American, Miss Dorothea Lin Dix. With Drs. Fremont and Morrin, Douglas, by contract, and for three years, rented a house in Beauport, the property of Colonel Gury. This house was the manor built in Champlain's time by Robert Giffard, the first seigneur of Beauport. The contract was renewed two or three times and Douglas did not dispose of his share till 1865. Drs. Morrin and Fremont had died, the former in 1861 and the latter in 1862, and they had been replaced by Dr. J. E. Landry.

The patients had been transferred from the Hôpital Général of Quebec, the Hôpital Général of Montreal, and the Hôpital des Ursulines of Three Rivers. Used to confinement, they marvelled at their new freedom. No longer shut up in a cell, they lived and ate together and worked, the men in the gardens, the women knitting or mending. Some recovered and were permitted to leave the asylum; the others became gentle and easy to handle. Douglas showed them more patience than to sane people, loving them like children and fearing lest his work be destroyed. He had laboured earnestly, treating his patients after the human methods advocated by Pinel and Esquirol.

From 1865, his main interests were real estate and mining. He had acquired a rather large fortune during his medical career and owned vast tracts of land which he sold at a good profit. But he was not so lucky in his mining business. Clinging to costly, non-profitable workings, he often would not give up despite the retirement of all his partners. In the end, he lost all his wealth and "Glenalla", his property, was auctioned in 1875.

As we already saw, he had married in Utica. Left a widower in 1828, he wedded, in 1830, Elizabeth Ferguson, by whom he had four sons. Two died in childhood and two survived: George, of a sensitive temperament, who passed away two years after his mother, in 1859, upon being commissioned in the Imperial Army in England, and James. The latter co-operated actively with his father, particularly in Beauport. He studied theology in Scotland and medicine at Laval, yet became neither a minister nor a doctor. He worked, instead, with Sterry Hunt, and devised a technique for extracting copper through which he was to enter the metallurgical field and make a fortune. In 1875, he lived in Phoenixville (Pa.). He took with him his then old and poor father, who brought along a number of mummies collected on his trips to Egypt.

Dr. Douglas lived the last 11 years of his life with his son and with the latter's family, relating his travels and contributing to local papers. He had a stroke of apoplexy on April 10, 1886, and died on the 14th, without regaining consciousness. He was buried in Mount Hermon, a cemetery he had helped to create, near Quebec.

Douglas was a personality and his contribution to Canadian Medicine was great. Stubborn,

honest, exacting with himself, he could hardly understand, at times, that anybody could differ from him. His obstinacy sometimes led him to resort to dictatorial ways which were termed tyrannical. He was a skilled surgeon and young men would travel from distant places to learn surgery with Douglas. He liked his patients and would never hesitate to get up at night or from the dinner table to answer the call of a patient. He rose early, at 5 o'clock each morning. In his home, breakfast was served at six; and no excuse was accepted for being late at breakfast.

He originated in Canada rational methods for the treatment of the insane. This was a considerable responsibility to assume at that time, as the success of such an undertaking could not possibly be achieved without political interference. He never engaged in religious or political quarrels. Well aware of his impulsive disposition and of his aversion to equivocal stands, he refrained from entering politics. He wrote but little and his writings deal with memories of his travels and with historical events rather than with medical facts. He seldom appeared in public and only lectured on temperance of which he was, with Chiniquy, an ardent advocate. He was tall. In his late years, he made a striking picture with his thick white beard and hair. Oliver Wendell Holmes, meeting him in New York, compared him with Phidias' Zeus at Olympia.

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## ASSOCIATION NOTES

### YOUR PATIENT PAYS TAXES, TOO

In addition to the responsibilities connected with filing their personal income tax returns, members of the medical profession have a duty to their patients to assist them to establish their claims for permissible deductions for certain medical expenses.

The medical expenses are of two types:

(a) Payments to a hospital or qualified medical practitioner, dentist or nurse.

(b) Payments for injectible liver extract or vitamin B<sub>12</sub> for pernicious anaemia, insulin, cortisone, adrenocorticotrophin (ACTH), if such drug has been prescribed by a medical practitioner; or an artificial limb, spinal brace, brace for a limb, hearing aid or wheel-chair.

The patient requires from his physician a receipted account in respect of medical expenses under (a). The items referred to in (b) concern payments to druggists and others not included in (a) and the physician's only responsibility here is in connection with the prescription required for the drugs.

It is not necessary for the patient to have a prescription for each purchase or each receipt but only that the drug has been prescribed by the physician for him, his wife or dependents.

For your further information, the full amount of the medical expenses is not allowable. Only that portion of the expenses over 4% of the taxpayer's net income may be deducted and the total deduction for medical expenses may not exceed: \$750.00 for single persons and \$1,000.00 for married persons, with an additional amount of \$250.00 for each dependent, up to \$1,000.00.

### THE ANNUAL MEETING

For the 83rd Annual Association Meeting the committee on arrangements has been fortunate to obtain not only the Banff Springs Hotel but also the Chateau at Lake Louise for members of the medical profession. Arrangements have been made to provide fast, efficient and frequent commuter service between the Banff Springs Hotel and the Chateau at Lake Louise. These two sites are connected by an excellent mountain highway and also by the main line of the Canadian Pacific Railway. The thrilling motor trip between two of the most famous resorts in the Canadian Rockies, covers 40 miles of the most exciting scenic highway on the continent. Along this route you will see the Vermilion Lakes and majestic Mount Rundle, fascinating Mt. Hol-in-the-Wall, Pilot Mountain, Mt. Ball, eternally snow-capped Mt. Temple and rugged Mt. Eisenhower. You will also obtain an excellent view of the constellation grouped around Lake Louise and the distant delicate silhouette of the Ten Peaks. Along the highway you may encounter deer, elk, moose, bear, sheep or goats. One may include a stop at Johnson's Canyon to visit the Canyon and the Falls at the upper end.

Against a backdrop of towering peaks crowned and engirdled by great glaciers lies a small quiet lake of brilliant emerald green—the celebrated Lake Louise. Set like a precious gem in the amphitheatre formed by the sheltering mountain peaks it is probably the most beautiful of all the Rocky Mountain Lakes.

Built close to the water's edge, amid green lawns and riotous bloom, the Chateau Lake Louise becomes an integral part of the idyllic scene. Long before white man ever saw this perfect little lake it was famous among the Indians who called it the Lake of the Little Fish, a never-fading painting, given them, they believed, by the Great Spirit. The first white man to visit it was Tom Wilson the man who first discovered many now famous beauty spots of this region, and it was he who named it Lake Louise in honour of Princess Louise, daughter of

Queen Victoria and wife of the Marquis of Lorne who was then Canada's Governor-General.

Lake Louise to Columbia Icefield: Along the Ridge of the Continent, amid great towering peaks, and skirting vast glaciers, this tour brings you to the largest body of ice south of the Arctic—Columbia Icefield. As a one-day excursion from Lake Louise, with luncheon at the Chalet and a visit to the Icefield, or as part of the trip between Lake Louise and Jasper, this tour cannot fail to impress you with the thrilling magnificence of the Canadian Rockies.

APPLICATION FOR ACCOMMODATION  
CANADIAN MEDICAL ASSOCIATION  
Banff, Alberta, June 9 to 13, 1952.

Mail this form direct to:

Dr. A. E. Wilson,  
904 Greyhound Building,  
Calgary, Alberta.

Please make the following reservation for C.M.A. Convention:

☐ Single.  
☐ Double.

☐ Twin beds.  
☐ Suites.

First choice.

Second choice.

at Hotel .....

Cabin .....

Please include names of all persons who will occupy rooms. (PLEASE PRINT).

Name.

Address.

City.

Province or State.

Arriving Banff .....at.....A.M.....Date of Departure .....  
P.M.

☐ Train ☐ Car ☐ Plane

PLEASE RESERVE EARLY:

This application is submitted by me as:

☐ Member of Executive Committee.  
☐ Delegate to General Council.  
☐ Contributor to Scientific Program.

☐ Member C.M.A.  
☐ Visiting Doctor.  
☐ Exhibitor.

☐ Member Affiliated Society (Name .....)

Send Confirmation to Doctor .....  
(PLEASE PRINT)

(City)

(Prov. or State)

The following accommodation will be available.

Banff Springs Hotel }	Single	Double	Twin Beds	Suites
Chateau Lake Louise }	\$16.50	\$13.50		
	per day	per person, per day, two to a room		American Plan

Cabins (limited number) \$8.00 to \$18.00 per day

Additional accommodation will be available at first class hotels, i.e., King Edward and Mount Royal Hotels at reasonable rates.

Note: DEPLANING POINT FOR BANFF IS CALGARY.

Please Note:

(1) Accommodation at Banff Springs Hotel and Chateau Lake Louise will be considered as one hotel. There will be hourly bus service between Chateau Lake Louise and Banff Springs Hotel.

(2) Single reservations will be assigned to twin bedded rooms for occupancy by two persons, if necessary.

PLEASE CANCEL IMMEDIATELY IF YOUR PLANS CHANGE.

Among the lovely mountain lakes along this route are the Bow Lakes, source of the Bow River, lying at the base of Mt. Rhondda, and Lake Hector for which Mt. Balfour with its great glacier, part of the Waputic Icefield, provides a spectacular background. High up in the Bow Pass, over 6,000 feet above sea level, you look out across a small, exquisite lake, Peyto Lake, and down the beautiful Mistaya Valley. As the valley widens, and you circle the Waterfowl Lakes, you may see deer, elk or moose.

And then, flung out over the Roof of the Continent, among a galaxy of peaks that soar to heights of eleven and twelve thousand feet, lies the amazing field of ice, about 110 square miles in area and hundreds of feet deep. From the Columbia Ice Field streams flow thousands of miles to the Pacific, the Arctic and the Atlantic Oceans.

Those who make the return trip to Lake Louise will be delighted to discover that the change of direction transforms the scenery along the whole route so that you seem to be making a complete new tour.

Moraine Lake and the Valley of the Ten Peaks: As the tour between Lake Louise and Moraine Lake skirts Mt. Fairview and gradually ascends the side of Bow Valley, there open before your eyes glorious panoramas of the Bow Valley, the Banff-Lake Louise highway far below, and the rugged reaches of Mt. Hector, the Pipestone Range and Mt. Eisenhower. Then suddenly, as you circle Mt. Temple and emerge from the deep forest to the steep, rocky slope, you come upon an incomparable spectacle. Ahead is the precipitous wall formed by the Ten Peaks, each over 10,000 feet high, and all outlined by a series of hanging glaciers, forming a segment of a great circle in which lies Moraine Lake. To the left of the Ten Peaks soars the Tower of Babel, and farther to the left is Consolation Valley above which Mt. Quadra and Bident rise dramatically from the forest below to vast hanging glaciers high above.

Lake Louise to Emerald Lake: Connecting two world-famous beauty spots of the Canadian Rockies, this trip traverses a region of towering peaks and canyons, glaciers, forest, lakes and rivers, unfolding scene after scene of matchless beauty. You travel down the Kicking Horse Canyon, around the Lake Louise constellation and over the Great Divide. You see the remarkable Spiral Tunnel, the curious Natural Bridge, the marvelous Yoho Valley and the Takakkaw Falls, third highest in the world. No drive on the continent can boast of more spectacular and varied mountain scenery.

In addition to the remarkable sight-seeing trips that radiate from Lake Louise, there are also many recreational facilities such as, swimming, climbing, riding, hiking and photography. Lake Louise provides a remarkable setting for a most enjoyable holiday, and for the one who remains at Banff and merely wishes to visit Lake Louise

or whether one wishes to make Lake Louise their temporary home away from home, one cannot fail to be impressed by its beauty and rejuvenated by its grandeur.

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### REDUCED FARES FOR RAIL TRAVEL TO THE ANNUAL MEETING

The Canadian Passenger Association has authorized special convention rates for members of The Canadian Medical Association and their families travelling by rail to the annual meeting in Banff. Identification certificates permitting members to purchase tickets at a considerable saving may be obtained on application to the General Secretary, Canadian Medical Association, 135 St. Clair Avenue West, Toronto 5, Ontario.

#### DATES OF SALE

From stations on Western Lines (*i.e.*, all points west of Fort William and Armstrong, Ontario)—June 1 to 6.

From stations on Eastern Lines (*i.e.*, Fort William and Armstrong, Ontario, and all points east thereof except Newfoundland)—May 29 to June 3.

From stations in Newfoundland—May 26 to 31.

#### FARE BASIS (Adult)

Going and returning the same route—One and one-half times the adult normal one-way first, intermediate or coach class fare applying via route used as shown in tariffs, plus 25 cents.

Diverse Routes—Three-quarters of the one-way first, intermediate or coach class fare, as the case may be, applying from starting point to destination via route travelled on going trip, plus three-quarters of the one-way fare of the same class applying from starting point to destination via route travelled on return trip, plus 25 cents.

#### RETURN LIMIT

Thirty days after the date on which the ticket is valid to start the going journey. Return trip may commence on any date within final return limit, and passenger must reach original starting point not later than midnight of final return limit.

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### THE ARMY BENEVOLENT FUND

THE FOLLOWING LETTER, with its enclosure, has been received in the General Secretary's office, from the head office of the Army Benevolent Fund, Ottawa, dated January 29, 1952.

"Dear Dr. Routley:

I am attaching hereto a memorandum outlining the views of the Army Benevolent Fund Board in connection with the matter of relations with the Canadian Medical Profession.

It is hoped that, in forwarding these views to your Association, this Board can explain our efforts to ensure that the understanding between the Fund and medical doctors continues on the present satisfactory basis.

The one thing which the memorandum perhaps does not convey is the deep feeling of appreciation which exists among officers of this Fund towards the Medical Profession.

The co-operation which has been possible between medical doctors and the business and professional men who represent this Board on our Provincial Committees is of far reaching effect, and there are many young veterans' families today who have been permitted to re-establish themselves as responsible citizens because of this co-operation.

It is realized that this has been due in no small measure to the efforts put forward by the Canadian Medical Association, and by yourself, and through the medium of this letter I would wish to express, on behalf of the Board, our personal appreciation to your Association and to Canada's physicians and surgeons generally.

Yours very truly,

J. C. Murchie,  
Chairman.  
Army Benevolent Fund Board."

The memorandum reads as follows:

*"To the Canadian Medical Association—*

The Army Benevolent Fund Board, at its Annual Meeting concluded in Ottawa today, has resolved to write to your Association in connection with several matters concerning liaison with members of the Medical Profession in cases involving needy veterans.

The Board and its Committees have enjoyed excellent co-operation with the Medical Profession during our four years of operation, and particularly since the publication of an article in the Canadian Medical Association Journal in April, 1949 with respect to the Fund's policy of settlement of accounts.

It is estimated that 35% of the Fund's expenditures are directed towards the payment of accounts owing to physicians and surgeons. It is possible to advise that, in practically every instance, the doctor is prepared to cancel part of his fee as a contribution towards the welfare of the needy veteran's family. In this regard, we would wish to express the appreciation of this Fund, and of veterans generally.

During the past year, the Board has taken cognizance of a regulation of the Income Tax Act which requires this Fund to report to the Taxation Division all fees paid to doctors in excess of \$100.

The Board has been apprehensive of the possibility that this requirement might lead to misunderstanding with the Medical Profession, inasmuch as this Fund is a non-governmental organization. Accordingly, we have made representation to the Department of National Revenue asking that the Fund be relieved of this obligation, but the Board is now in receipt of official advice to the effect that we must continue to report such payments.

The Board would wish your Association to know, however, that such action is not being taken by this Fund voluntarily and we are reporting such payments because this is required by law.

Another aspect of the arrangements between this Fund and the Medical Profession involving the Department of National Revenue is the question of whether or not it would be possible to furnish doctors with a receipt for a donation, in instances where the doctor has cancelled part of his account as a contribution towards the welfare of the individual veteran and his dependents. A considerable number of doctors have made this request of the Fund.

This Fund has been recognized by the Federal Government as a charitable institution, and has been empowered to issue receipts which are deductible from taxable income. Hence, the Fund would be able to issue a receipt in circumstances where the doctor is paid the full amount of his fee from the Fund and subsequently returns part of it as a donation to the Fund by way of a contribution to the veteran's family. It will be realized, notwithstanding, that although the doctor could deduct the donation from his net income, there would be no advantage in such transaction inasmuch as this donation portion would have to be added to his net income when received from the Fund.

It would seem, therefore, that the only practical procedure is to continue to operate on the present basis under which the doctor makes his contribution as represented by that portion of his account which he does not receive. Although he is not issued a receipt for a donation in this amount, neither does he have to include it as a part of his taxable income.

The Board would wish to explain this matter of donations to your Association as an indication that we are anxious to ensure that the doctor receives proper credit for the contribution he is making to the veteran's family.

It would seem that, inasmuch as the issue of a receipt is not practical, the value of such contribution will have to remain as an intangible, yet nevertheless vital benefit.

Perhaps the only method available to this Fund of ensuring that Canada's physicians and surgeons receive proper credit for such donations is for this Fund to continue to publicize, in a general way, the many contributions made by the Medical Profession to the welfare of the Canadian veteran and his community.

This Fund has taken every opportunity to ensure that the co-operation of the Medical Profession in cases of financial distress is brought to the attention of veterans and the many agencies, organizations and associations with which our officials are in contact. In this regard it seems possible to suggest that the humane, considerate and gracious attitude of the doctors who have been able to co-operate with this Fund has done much to encourage the perpetuation of the ideal of private enterprise as it applies to the Medical Profession.

It should be mentioned that the Fund is indebted, also, to a large number of doctors who have been referring patients to this Fund when it has developed that there is a problem of financial distress—and in such cases, it is usually possible for this Fund to award financial assistance in payment of the medical bills and to provide such other requirements as appear to be necessary to return the family to a position of economic stability.

It might be added that, in those instances where financial distress has resulted due to medical costs, the Fund will encourage the family to subscribe to a medical plan, and in some instances, this is laid down as a condition which must be fulfilled before the Fund is prepared to render financial help.

In closing, we would wish to mention that this Fund has been in communication with a great many doctors over the past few years. From the indication which we have received, it would appear that the Medical Profession is satisfied with the policy of this Fund as it applies to medical services, and, for our part, the Board has already expressed its appreciation in this letter for the valuable co-operation of doctors which has enabled this Fund to render the maximum possible assistance to needy veterans.

H. C. Chadderton,  
National Secretary.

J. C. Murchie (Lieut. General)  
Chairman,  
Army Benevolent Fund Board.

*Members.*—J. Guy Gauvreau (Brigadier); Aubrey C. Peck; E. W. Sansom (Lieut. General), Canadian Legion of the B.E.S.L.; A. J. Wickens, National Council of Veteran Associations in Canada.

## MEDICAL SOCIETIES

### *Medical Journalists' Conference*

It is not very often that a conference on medical journalism is held in Canada, with a whole day devoted to its discussion. Indeed, we may say that until now it has not ever been done. Therefore the first occasion of this sort is well worthy of record.

The meeting was held in Toronto on January 25, at the instance of the editorial management of the *Ontario Medical Review*; and it will be transgressing no secrecy

to say that the whole affair depended largely on the initiative and energy of Dr. Wm. Feasby, the editor of the *Review*, ably assisted by his publishing office, Current Publications.

Those in attendance included editors of undergraduate medical journals of Toronto, London and Ottawa universities, and senior editors from *The Journal of the American Medical Association*, *Canadian Medical Association Journal*, and *American Journal of Psychology*. Beginning with an interesting tour of the Current Publications' establishment, during which all the details of a busy publishing house were displayed and discussed, the conference moved over to the Murray Printing Company's offices, and watched the actual process of printing in all its varied and intricate details.

The luncheon which followed on the invitation of the Murray Printing Company, provided for a panel of "experts" including editors, advertising representatives and business executives, to whom various questions on medical journalism were submitted. The ethics of advertising; the responsibility for authors' opinions; the supply of material; all these were discussed in detail, and evoked so much interest that the closing of the debate by the genial but time-limited chairman, Dr. Arthur Kelly, our Deputy General Secretary, was only done with great regret.

In the afternoon Dr. Victor Johnson presided at a session at the Toronto Western Hospital, opened by a talk by Dr. Rhodes of the School of Hygiene on common editorial difficulties. In spite of speaking at only short notice, Dr. Rhodes gave an excellent commentary on the difficulties attending the production of good medical journalism, ending with a suggestion that at times editors might allow some latitude in the case of papers with original if debatable ideas. In the discussion it was pointed out that desirable as free expression of opinion was it still behoved the editor to move warily where purely theoretical views were submitted. Dr. Rhodes also mentioned the value of correspondence, and again in discussion it was shown that whilst editors heartily welcome correspondence the difficulty was to get men to express themselves in letters rather than in set papers. In British journals there always seemed to be no lack of correspondence, but it was suggested that this was because the habit of letter writing is more general in Great Britain than on this side of the Atlantic. Still, as Dr. Austin Smith pointed out, with judicious stimulation more correspondence might become available in medical journals than at present.

The various aspects of advertising were then dealt with by Mr. R. Messier of the Canadian Pharmaceutical Manufacturers Association. Mr. Messier stressed the importance of a clear understanding of the point of view of the advertiser by the editorial direction and vice versa. The maintenance of the excellent relations between the two was evidence of the continual effort made in this direction.

Dr. Austin Smith, Editor of the *J.A.M.A.* then gave a masterly address on some aspects of medical journalism. He had found, as others had, that the number of men fitted for or desirous of doing medical journalism is very small; but on the other hand he had always been impressed with the willingness of the profession generally to help in various ways, without hesitation.

At a dinner in the evening, Professor J. C. B. Grant gave an extremely interesting paper on Place Names in Great Britain, showing the influences left by the various waves of invaders and settlers.

The one criticism to be made of the meeting was that the day was not long enough to do justice to the very full program. It is hoped that meetings of this nature will be held in the future.

### *The Prince Edward Island Medical Society*

At the November meeting of the Society which was a Dinner Meeting at the Charlottetown Hotel, the guest speaker was Dr. W. D. Stevenson of Halifax, neurosurgeon, who spoke on "Treatment of Head Injuries". At

the December meeting, the guest speaker was Dr. A. L. Chute of the Staff of the Hospital for Sick Children, Toronto, who spoke on "Some Aspects of Kidney Disease in Children". These two speakers were provided through the Dalhousie University Postgraduate program.

### *University of Toronto*

The Physiological Society of the University of Toronto has recently heard these speakers: Sir Edward Mellanby, London on Aspects of Nutrition; Dr. A. M. Rappaport on Experimental Ischaemia of the Liver and Hepatic Coma; Dr. J. Markowitz on Effects of Penicillin on the Survival of Hepatectomized Dogs; Dr. C. J. Labuschagne, University of Cape Town, South Africa and the Banting and Best Department of Medical Research on The Extraction of Insulin from Whale Pancreas; and Dr. J. B. Firstbrook on The Influence of Heparin on Plasma Lipoproteins and on Atherosclerosis. LILLIAN A. CHASE

## MISCELLANY

### WORLD MEDICAL ASSOCIATION

[A general report on the Fifth Annual Meeting of the World Medical Association by Dr. Norman Gosse, one of our official delegates appeared in our January issue.

The following summaries from the official minutes of this meeting are also presented.]

#### FINANCES

FROM THE FINANCIAL point of view it should be pointed out that the support of WMA depends mainly, though not entirely, on the United States Committee, Inc. WMA is not self-supporting, and has a yearly deficit which is met by this Committee. The Council of WMA in a formal resolution expressed deep gratitude to the U.S. Committee for its continued support. The 1951 expenditures were more than \$75,000.00 and the budget for 1952 is \$82,600.00. The eventual operating costs will probably be more than \$100,000 annually.

Life-memberships for \$500.00 in the WMA have been made available: 28 individuals have subscribed to these. The American Medical Association has increased its contribution from \$2,000.00 to \$8,000.00 per annum.

#### MEDICAL CARE AND ALLIED SUBJECTS

A resolution was adopted to the effect that "as the medical profession now has at its disposal an increasing number of powerful remedies, the General Assembly of The World Medical Association urges all national medical associations to press for controlled clinical trials of all new remedies before they are generally released for use in medical practice. The public should be warned of the dangers of the indiscriminate use of these substances without medical guidance."

#### SOCIAL SECURITY

It would be difficult to speak of this meeting of the WMA without referring to its discussions on social security. But it would be equally difficult to give anything like a full account of them in a short space. A whole day was devoted to this one subject, and a majority of member countries expressed their opinions. It is seldom that an opportunity presents for such an international survey of the problem of social security.

In the first place it may be said that no country opposed the necessity for planning for social security. Those countries in which such plans are in operation

show no signs of wishing to discontinue them, however much it may be desirable to modify them.

Again, steady vigilance must be maintained with regard to the part of government in social security schemes.

More than once it was pointed out that social security should emphasize the responsibility of the individual. Human rights imply responsibilities.

One speaker felt that it should be possible for public money to be employed to assist in the application of medicine and surgery to the sick without public domination and control of medicine. What is needed is a partnership between a great profession like our own and the authority of the state. This is not simply a medical problem, but is one of our time; whether or not the state can be a partner with groups of its citizens and not always their master.

If, as one speaker suggested, the profession should have a right to impose its conditions, it should be remembered, as another speaker insisted, that organization requires that the profession provide itself with the power to impose its conditions.

Some smaller countries spoke of their difficulties in resisting socialization of the medical profession. They looked to the WMA for guidance and assistance.

The place and growth of voluntary health insurance plans were given due prominence.

## SPECIAL CORRESPONDENCE

### *The London Letter*

(From our own correspondent)

#### THE GENERAL PRACTITIONER AND THE HOSPITAL SERVICE

In 1949 the Secretary of State for Scotland asked the Scottish Health Services Council "to consider and advise him on the relationship between the general practitioner and the hospital service". The findings of the Council have now been published in the form of a report. One of the fundamental criticisms of the National Health Service has been the extent to which it has deprived general practitioners of the use of hospital beds. In the words of the Report, "the prevailing disquiet can in its broadest terms be expressed as a feeling that hospital work is becoming almost exclusively the sphere of the specialist and the hospitals themselves a preserve where the general practitioner is neither needed nor welcome".

The Report agrees that there is justification for this disquiet; it reiterates the view that general practice is the basis of a comprehensive medical service and that anything which enhances the status and efficiency of general practice will be to the benefit of the Service as a whole. One means of attaining this increased efficiency is to allow general practitioners more access to hospital beds for their patients. This in turn would involve a reorganization of general practice so as to allow general practitioners more time for hospital work. They contend that there is "a strong case" for the provision of hospital beds in which general practitioners can treat their own patients, and they put forward a detailed series of recommendations. In the first place, what are known over here as "cottage hospitals" should be reintroduced as general practitioner hospitals. They always were regarded in this way, but with the introduction of the National Health Service there has been a tendency for them to be monopolized by specialists. In "district hospitals", i.e., general hospitals outside the main teaching centres, there can in present circumstances be little scope for the provision of beds in which general practitioners can treat their own cases, but the authorities are asked to keep a careful watch upon the repercussions of this on the standards of general practice. In "central hospitals" there is little scope for the provision of beds for the general practitioner, but they ask for some con-

sideration to be given to the possibility of establishing general practitioner wards or blocks in association with general hospitals.

These are but a few of the recommendations of a report which is outstanding for its fresh and impartial review of a problem which is causing much concern in the profession as a whole. The case for the general practitioner has seldom been better stated.

#### SHORTAGE OF X-RAY FILMS

"Crises" in post-war Britain are so common as scarcely to be news, but in spite of their lack of novelty they can still cause considerable inconvenience on occasion. The latest in the National Health Service is the shortage of x-ray film. Films have never been in free supply since the end of the war, but since 1948 the problem has become steadily worse. Things have now reached such a pass that in December the Chief Medical Officer to the Ministry of Health sent a letter to every practitioner appealing to him for his assistance in cutting down the amount of film that was used. Like any official move, this was a somewhat belated one. The Joint Tuberculosis Council, for instance, has stated that "it will take only a slight further deterioration in the situation to bring about a widespread dislocation in the chest services".

The precise cause of the shortage is still rather obscure, but two important factors are the increased usage in this country and the increased quota for export. According to Ministry of Health figures, usage of film in this country during the first six months of 1951 was 16% greater than in the corresponding period of 1950 and was at a rate about 60% greater than in 1947. The official figures for the export of film (for the eleven months January-November in each case) are 7,591,000 square feet in 1949, 8,632,200 square feet in 1950 and 13,997,000 in 1951. On the question of economies in the use of film there is an embarrassing variety of opinions. The two dominant factors responsible for increased usage are: (a) the number of new x-ray units which have been set up since the introduction of the National Health Service, and (b) the increasing tendency of patients to demand, and doctors to request, radiological examinations now that they involve no extra charge for the patient. Whether the increased supply which is promised for the coming summer, taken in conjunction with an effort on the part of every doctor to reduce his requests for x-ray examinations, will ease the position remains to be seen. With our happy national facility for compromise, it probably will!

#### POLIOMYELITIS IN 1951

Figures are now available for the incidence of poliomyelitis in England and Wales during 1951. These show a marked decrease compared with 1950, but are still three to five times the endemic level before 1947. The figures for the last five years are: 1947, 9,251; 1948, 2,175; 1949, 6,850; 1950, 8,699; 1951, 3,093. The main peak occurred in the week ended July 21, but there was a secondary peak week in the week ended October 20. In 1950 the peak week was August 26.

#### CARCINOMA OF THE LUNG

Carcinoma of the lung has become top-line news since British and American workers suggested the possible correlation with tobacco. There has therefore been considerable interest in an analysis published by *The Lancet* of the relevant sections of the annual reports for 1950 of the 29 London metropolitan boroughs. These show that, for the first time, deaths from neoplasms of the lung and bronchus were more numerous than deaths from tuberculosis in 17 out of the 25 boroughs in which the reports contain the relevant data. Four boroughs had to be excluded as their reports did not analyze deaths from malignant disease according to their site. In the remaining eight boroughs deaths from tuberculosis still exceeded those from pulmonary and bron-

chial neoplasm, but in six of them the excess was small. Part of this approximation is due to a fall in the number of deaths from tuberculosis, and the fall suddenly increased between 1949 and 1950 in a number of boroughs. Whether this is the entire explanation is doubtful but, as *The Lancet* points out, "the shift in importance of the two diseases, as causes of death, demands attention".

LORD HORDER

Last month his former house physicians entertained Lord Horder to dinner on the occasion of his 81st birthday. When one sees his dapper upright figure, listens to his brilliant often Puckish, conversation, and notes his many public engagements, it is difficult to realize that he is an octogenarian. In his time he has played many parts. Eugenics, euthanasia, cremation, smoke abatement, have all found in him an enthusiastic advocate. An experienced broadcaster, he has already won his spurs on television. There is scarcely a Government department which has not called him in, and since 1948 he has been the leader of the rearguard action being fought by those members of the profession who are still actively opposing the full implications of the National Health Service as it is organized at the moment. With it all, he has maintained his position as one of the most brilliant clinicians in the country. In the words of one of his former house physicians, "A busy life, planned relaxation, good humour, and, above all, a zest for living with a love of people and of Nature, are the diagnostic signs of our physician's philosophy".  
London, February, 1952. WILLIAM A. R. THOMSON

## OBITUARIES

DR. GORDON ARMSTRONG, aged 60, died in hospital on December 31, 1951 from head injuries suffered when he fell downstairs in his home. During 1936-37-38, Dr. Armstrong was the stormy petrel of the board of education in Toronto. In World War I he won the DSO and was twice mentioned in dispatches. He served overseas in the Imperial army in Mesopotamia in command of a British base depot as medical officer and was eventually invalided to England. He also served in the 8th Battalion, North Staffordshire regiment, and was twice wounded. His widow and one son survive.

DR. FREDERICK ALLAN AYLESWORTH, aged 69, died on December 22, 1951. Born at Bath, he graduated in medicine from Queen's University and took post-graduate work in Boston and England.

During World War I, he served overseas with a Harvard University unit. He was at one time on the staff of Christie St. military hospital and was active on the board of the Canadian Institute for the Blind. He is survived by his widow, one daughter and three sons.

DR. WILLIAM HENRY BALLANTYNE, died unexpectedly on December 27, 1951 at Barbados, B.W.I. He was 69 years old. Born at Kingston, Ont., educated at Kingston schools, he graduated with his medical degree from Queen's University in 1905.

He practised from the time of his graduation till the outbreak of the First World War at Vernon, Ont. He then joined the Queen's University Hospital, No. 7, and went overseas in 1915.

Upon his return to Canada, he was promoted to the rank of lieutenant-colonel in charge of the Sir Sanford Fleming Convalescent Home, in Ottawa, in 1918. He was appointed to act as Ottawa district administrator for the DVA in 1919. He held this post for the DVA, formerly the Soldiers Civil Re-establishment for 30 years, retiring three years ago.

DR. D. A. BENOIT, of Montreal, Que., died on December 26, 1951, after a lengthy illness, in his 72nd year. Born in Montreal, Dr. Benoit was educated at St. Mary's College, University of Montreal, and Paris. He is survived by his widow and a son.

DR. OSCAR A. CANNON died on December 25 in Hamilton, Ont., after a lengthy illness. Born in Bruce County, Dr. Cannon was educated at Walkerton High School and graduated from the University of Toronto in 1907 as a silver medalist. He was medical officer at the Steel Company of Canada for 25 years. Dr. Cannon taught school in Dunkeld, Ont., for three years, and practiced medicine in Stratford from 1907-1915. He went overseas with the Canadian Army Medical Corps in 1915 and was medical officer of the 17th Battalion. He then served as medical officer of the Moore Barracks Hospital and aboard the hospital ship *Aquitania*. In 1917 he was sent to China by the Imperial Government in connection with mobilization of the Chinese labour battalions. He was on the staff of the Hamilton General Hospital and was a former president of the Hamilton Academy of Medicine and district superintendent of the St. John Ambulance Brigade. He leaves his widow, one daughter and one son.

DR. CLIFFORD G. CLEMENTS, aged 58, died suddenly on December 4, 1951, in Wawota, Ont. Dr. Clements was born in Fairmede district. He started school at Fairmede and later attended school in Wapella. He studied medicine at McGill University and took post-graduate studies in Vienna, Austria. He began his practice at Wawota in 1922 and remained there. For many years Dr. Clements was doctor for the whole district north and east of Wawota, right through to the boundary of the Moose Mountains on the west. A great curler and all round sportsman, Dr. Clements was an enthusiastic worker in his community. Surviving are his widow and two daughters.

DR. J. HARRY CONDON, died suddenly January 10, 1952. He was 70 years old, and was in active practice until his death. Dr. Condon was born in Altoona, Pa., and was graduated *cum laude* in medicine from New York Medical College. He is survived by his widow, a son and a daughter.

DR. MARK DELANEY, died on January 2, 1952 at his home in Summerside, P.E.I., at the age of 78. Born at House Harbor, Magdalen Islands, Dr. Delaney studied at St. Dunstan's University, Charlottetown, P.E.I., before attending Laval. After practising medicine in New Brunswick and Prince Edward Island for a number of years, he went to Paris to win a postgraduate degree at the Sorbonne. Later he practised at Chatham, N.B., and then returned to Prince Edward Island, where he remained until his retirement, when his son, Dr. Austin Delaney, took over his practice. Survivors are his widow, three daughters and four sons.

DR. EDGAR GEORGE EVANS, a pioneer doctor in Ontario's northland, died on January 7, 1952, in Huntsville, Ont. Dr. Evans was born in Virginia Beach and graduated in medicine from the University of Toronto. After graduation he became ship's surgeon on the run from Southampton to South Africa, later moving to Northern Ontario where he attended men in lumber camps. When the Canadian Northern Railway was being built he operated hospitals at Byng Inlet, Sudbury and Parry Sound, travelling from one to the other by dog team. He came to Huntsville in 1916. Baseball was his hobby, and he had been manager of the Huntsville team which several times reached the Ontario finals. He leaves his widow and one daughter.

DR. HAROLD CRAIG HAGYARD, a physician in Perth, Ont. since 1920, died December 21, 1951, at the age of 60. Dr. Hagyard was born at Milton and received his

primary education at Milton and Georgetown. He graduated from Queen's University in 1915 and practiced for a short time at McDonald's Corners before joining the Canadian Army Medical Corps. During the Second World War he organized a Red Cross blood donor clinic for Perth and district. He was instrumental in obtaining the present Red Cross headquarters at Ottawa. He leaves his widow and two daughters.

DR. J. OSWALD HANDFIELD of Montreal, Que., died on January 6, 1952 in Los Angeles, Cal. Dr. Handfield, practised in Montreal for 40 years. He was 71. Born at St. Marc de Richelieu, he was a graduate of Laval University and did postgraduate work in Paris before coming to Montreal. For two years, he was assistant to Dr. Ernest Gendreau at the Radium Institute. He is survived by his widow and a daughter.

DR. HOWARD HARVEY died on January 15, aged 77. Graduating in Arts from Manitoba College in 1897 and in Medicine from Manitoba Medical College he practised in Winnipeg. During the "hungry thirties" and for fifteen years he was medical relief officer for the city, a task to which he brought sympathy and understanding. A fine football player in his student days he retained his love of sport as a member of the Granite Curling Club and the Riverview Bowling Club. He served overseas in the first World War as captain in the R.A.M.C. He is survived by his widow and one son.

DR. I. W. LYNN, aged 80, passed away on November 16, 1951, at his home in Desert Hot Springs, California, U.S.A. Dr. Lynn was born at Churchill, Ontario. He was educated at Cherry Creek public school, Innisfil, and at high school in Barrie. He later studied at University of Toronto and took postgraduate work in Chicago. He also studied in Germany. Dr. Lynn had many practises, among them practises in Toronto, Idaho, New York, Chicago, and his final practise in Desert Hot Springs, 100 miles distant from Los Angeles.

DR. OSCAR MARGOLESE, aged 69, died on December 30, 1951, in Los Angeles. He was born in Germany and brought up in Scotland. He studied medicine at McGill university and did postgraduate work at Edinburgh university. He began to practice in Winnipeg in 1906. Dr. Margolese was active in community affairs. He retired from active medical practice several years ago. Besides his widow, he is survived by three sons and one daughter.

DR. JOHN ELGIN MORAN of Lashburn, Sask., died at his home on December 3, 1951 at the age of 72 years. Born at Palmerston, Ontario, he attended Wesley College, Winnipeg, and graduated from the Manitoba Medical College in 1916. He took a one year postgraduate course and took up his practice in Lashburn in 1917. The late Dr. Moran was one of the few real family doctors left in the country. No call was too trivial, no distance too great. He was on call night and day and would travel long distances in all kinds of weather, winter or summer, in order to relieve human suffering. In May 1949 he was awarded a life membership in the Canadian Medical Association. Surviving are his widow and one daughter.

DR. BARTHOLOMEW DELMAR MUNRO, aged 76, died of a coronary thrombosis on January 3, 1952, in Toronto. Born in Uxbridge, where he received his early education, Dr. Munro graduated from the Ontario College of Pharmacy in 1898. After practicing for a short time as a druggist, he entered McMaster University and graduated in arts. In 1903 he graduated in medicine from Trinity College. During his university days he was active as a soccer player. He leaves his widow, a daughter, and a son.

#### AN APPRECIATION

DR. CHARLES D. PARFITT, M.D. For me one of the pleasantest features of the social dinner meetings\* of the Aesculapian Club in Toronto was to find Dr. Parfitt there,

to sit down beside him and to enjoy in however brief an exchange of words something of his wisdom and good nature. There was an indefinable quality that was a native part of him that drew one to him, and gave the feeling of a warmth of friendliness in all the many good meanings of that word. Dr. Parfitt was a fine person whom it was good to know.

My first knowledge of him was during World War I. When advice was needed on questions of soldier disablement in which especially tuberculosis was involved, Dr. Parfitt was the court of appeal. His careful and fair appraisal of all the circumstances of an individual case or of all aspects of a difficult problem left nothing to be desired. Somehow when one thought of Dr. Parfitt one thought also of another great personality—Dr. Trudeau. I can think of no higher tribute.

Dr. Parfitt was one of the small and diminishing number of men in this part of the country who had been personally associated with Osler, and whatever influences he may have derived from Canada's greatest physician harmonized so well with his own nature that the blend was perfect.

He considered himself fortunate, as he expressed it, that his clinical work began with the appearance of Osler's famous textbook, and near year-end 1897 he spent a fortnight at the recently opened clinic at the Johns Hopkins Hospital. Naturally enough he wished to continue to work under Osler but there appeared to be no opening at the time. His disappointment, he said, "was tempered by the kindness of the refusal". However, the Chief had been favorably impressed by Dr. Parfitt's qualities, and shortly after the latter's return home he received an invitation to return to Baltimore to do research work in tuberculosis, an opportunity made available by a special fund, to which, as Parfitt later learned, Osler was himself probably the main contributor. Thus became possible nearly two years of investigative and clinical work under Osler's guidance that laid the foundation of a career that was later to bear such splendid fruit in Canada.

Parfitt was rightly been called the Dean of the Specialists in Tuberculosis in Canada. He was a man of infinite patience, extremely thorough in his work, taking infinite pains, leaving nothing undone. His way with patients was a potent therapeutic factor. Their devotion to him was something special.

Of distinguished appearance, widely traveled, widely read, of many interests, Dr. Parfitt was a gentleman of the old-time breed whose dignity was reflected in an ease of manner that made approach to him so effortless. He was one of Canada's great men of medicine.

Osler retained a warm affection for Parfitt as evidenced by gifts and letters from time to time during his years at Oxford. In the last letter, written only four months before his death, speaking of the Hopkins days he said, "I often think of you and your rare gifts as father confessor in Ward C!"

Speaking of Osler's influence Parfitt had said, "To try to recreate in words the magic stimulus which poured from him is like trying to make sunshine and dew." That influence Parfitt himself transmitted. C. B. FARRAR

DR. WALTER MUDIE PATON, aged 53, eye, ear and nose specialist, and former resident of Toronto, Ont., died on December 18, 1951, from a heart attack in Vancouver, where he had practiced since 1931. Dr. Paton was born in British Columbia. Following graduation in medicine from University of Toronto in 1924, he took postgraduate work in the Mayo Clinic. He served in the First World War with the 53rd Battalion, and during the Second World War was surgeon commander at Cornwallis, N.S. He leaves his widow, and two sons.

DR. HAROLD AUSTIN WHITCOMB, died in Ottawa Civic Hospital on December 12, 1951, after suffering a heart attack while curling. A native of Smiths Falls, Dr. Whitcomb practised in Smiths Falls, Ont. from 1924 until 1942. He was educated in Smiths Falls public schools and at the collegiate. His years as a medical student at

McGill University were interrupted by World War I when he served as a surgeon lieutenant with the Royal Navy. He graduated from McGill in 1921 and then worked for three years in postgraduate studies at Montreal. He left Smiths Falls in 1942 to take a position as medical officer for the General Engineering Company of Canada in Toronto. Several years ago he accepted a post with the Canadian Pension Commission in Ottawa. He is survived by his widow, and one daughter.

DR. ARTHUR B. WRIGHT, aged 72, died on January 5, 1952 in Toronto at St. Michael's hospital. Dr. Wright, who had practised in Toronto for 40 years, retired two years ago. For some years he was on the staff of Toronto General Hospital. Born in Toronto, he attended the University of Toronto in medicine in 1902. During his student days, Dr. Wright played on the Varsity hockey team. He coached the Varsity football team, and was the first president of the Intercollegiate Hockey union. Surviving are his widow and two sons.

DR. H. P. WRIGHT died in Montreal on January 27 of cerebral thrombosis. Dr. Wright was born in Ottawa in 1888, and after attending Upper Canada and Ashbury Colleges went to Bishop's University where he graduated with an arts degree in 1909. He studied medicine at McGill University and interned at the Montreal General Hospital.

He was a doctor only a few months when the First World War broke out. He joined the Canadian Army Medical Corps and went overseas. He was promoted to major in 1917. He also served in the Second World War.

He was attending physician for a number of years at the Children's Memorial Hospital and the Montreal Foundling and Baby Hospital. In 1924 he became attached to the Royal Victoria Hospital and for years was demonstrator in paediatrics at McGill University.

He belonged to numerous medical groups, including the Canadian Medical Association, Montreal Medico-Chirurgical Society, Osler Reporting Society and was secretary of the Canadian Society for the Study of Diseases of Children. He belonged to the Alpha Delta Phi fraternity and the University Faculty, Royal Montreal Golf, Hunt, Reform, Senneville Golf, and Laurentian Lodge Clubs. He was instrumental in organizing the Farmers Club of Montreal and was its first president.

He also served as president of the Canadian Rheumatism Society and was among the first to advocate creation of occupational therapy schools, while medical director of the Occupational Therapy Centre. He is survived by his widow, one daughter, two sons and four sisters.

#### AN APPRECIATION

The long list of organizations and clubs to which Harry Wright belonged tell us something of the diversity of his interests, not only in medicine but in other things. And he belonged to them all because he was keenly interested in all that they stood for. Even then they did not satisfy all his energies, and he helped to form yet others himself. Soon after Osler's death he collected a group of us in Montreal and formed the first Osler Society in the city—the Osler Reporting Society. It typified many of his characteristics; his veneration and affection for Osler (who was his father's classmate); his desire to quicken not only himself but others in constantly striving to keep in touch with all that was going on in medicine; his instinct for social pleasure with his friends. He was a ferment, and even though he would have disclaimed any particular credit for his share in the organization he was steadily and strongly jealous of its welfare.

His many activities may have seemed to some as merely fitful, but he had not the nature to narrow himself to one interest. And if he went on from one occupation to another there was always behind it all his desire to help and make progress. His first and longest love was paediatrics, and it probably satisfied him most in its form of being a microcosm of medicine, although I think his genuine delight in dealing with young people is to be remembered also.

No meetings with him present lacked questions or suggestions, and in committee he was extraordinarily fertile of ideas. He sought many things, but they were not usually for himself.

But he was fortunate in possessing more than restless energy. He had the gift of charity in all the warmth of that most abiding of all human qualities. That was what lay behind his many friendships and his never failing solicitude for all that goes to make kindness of feeling amongst men. There is no doubt of Osler's deep influence on him in his youth, but he was good ground to begin with. He will be greatly missed. H.E.M.

#### ERRATUM

The name of Dr. André Gélinas of St. Hyacinthe, Que., was shown in our February number in the list of obituaries.

This was an error. The notice should have shown that the deceased was Dr. J. C. Gélinas, father of Dr. André Gélinas of St. Hyacinthe.

## ABSTRACTS from current literature

### MEDICINE

#### *Inhalation of Ethyl Alcohol for Pulmonary Oedema.*

GOOTNICK, A., LIPSON, H. I. AND TURBIN, J.:  
NEW ENGLAND J. MED., 245: 842, 1951.

In pulmonary oedema there is transudation of blood elements through the alveolar capillary walls into the air spaces of the lung and this transudate is whipped into froth by respiratory activity. Not only does this froth interfere with oxygen diffusion but the change from fluid to froth greatly increases volume and consequently greatly increases respiratory embarrassment.

Inhalation of ethyl alcohol in the presence of pulmonary oedema is an effective therapeutic measure, presumably because of an alteration of surface tension at the fluid-air interface producing collapse of foam bubbles. Two cases are reported by the authors where this form of therapy was considered vitally important, although it was considered to have been of value in other patients.

The equipment recommended consists of a single tank from which oxygen is passed through a vaporizer. The latter is an eight-ounce bottle, half filled with 50% ethyl alcohol, with a rubber stopper that holds two large-bore metal tubes. One of these tubes reaches to the bottom of the bottle and delivers oxygen, which bubbles through the alcohol; the other tube is above the alcohol level carrying the alcohol-laden oxygen to the meter mask. All sprayers and filters are removed so that loss of pressure is minimized. NORMAN S. SKINNER

#### *Medical Uses of Ion-Exchange Resins.*

ARNOLD, W. P.: NEW ENGLAND J. MED., 245: 331, 1951.

Ion-exchange resins have the property of selectively removing electrolytes from solution. They are stable, insoluble, nontoxic and capable of being regenerated. They are of proved value in industrial processes, chemical analysis and pharmacologic purifications and have shown some promise in clinical medicine. Cation-exchange resins find their principal clinical use in three conditions; in hypertensive cardio-vascular disease for the fixation and prevention of absorption of dietary sodium; in the prevention of oedema formation and the potentiation of diuresis in cardiac decompensation, cirrhosis and nephrosis; and for the treatment of hyperkalemia in renal failure.

Anion-exchange resins have their main clinical application in the treatment of peptic ulcer where they act by the adsorption of acid with a resulting elevation of the pH of the gastric contents. The pepsin level is lowered both by adsorption to the resin and because of the lowered acidity.

The draw-backs to therapy with the resins consist of a lack of specificity of action, a relative unpredictability of their action *in vivo*, the occasional production of acidosis (especially in the presence of renal failure), the production of hypokalaemia and the practical difficulty of administration because of bulk and unpalatability.

NORMAN S. SKINNER

#### *Steatorrhoea Following the Use of Antibiotics.*

MERLISS, R. R. AND HOFFMAN, A.: NEW ENGLAND J. MED., 245: 328, 1951.

Prolonged diarrhoea may follow the administration of chloramphenicol, aureomycin, terramycin or penicillin-sulphonamide combinations and this diarrhoea closely resembles and is apparently identical with the diarrhoea of the sprue syndrome. The authors consider that this diarrhoea is the result of a deficiency state secondary to the destruction of the normal intestinal flora, since it is known that certain vitamins of the B complex are produced by bacterial activity in the gastro-intestinal tract. The diarrhoea in these cases responds readily to parenterally administered liver, in conjunction with B complex by mouth. Four cases are presented in detail.

NORMAN S. SKINNER

#### *The Systemic Toxic Responses of Patients to Treatment with Streptokinase Streptodornase (SK-SD).*

HUBBARD, W. J.: J. CLIN. INVESTIGATION, 30: 1171, 1951.

Twenty-eight patients received a total of 90 injections of SK-SD for a variety of suppurative and haemorrhagic diseases. In 11 instances the urinary concentration of red cells and white cells was elevated in the absence of fever. In all other instances the urinary findings were coincident with febrile reactions. These changes commenced 12 hours after the commencement of treatment and subsided in 24 to 48 hours. Albumin and "glucose" were coincidentally present in febrile reactions, as were casts and other formed elements. The peripheral blood showed a leucocytosis of 3,000 to 18,000 white cells per c.mm. above normal. This commenced within five hours and lasted as long as the treatment was continued. Red cell and haemoglobin counts, erythrocyte sedimentation rates, prothrombin and clotting times were unchanged. Febrile reactions occurred in 20 patients on 67 occasions, this commenced 4 to 6 hours after therapy was instituted and reached a maximum in 24 hours, lasting 48 hours, there was a temperature elevation of 1.8 to 7.0° F. Studies of the temperature pattern showed this febrile reaction not to be a specific response to SK-SD. No chronic or delayed effects were noted.

J. A. STEWART DORRANCE

#### *Medical Indications for the Surgical Treatment of Acutely Bleeding Peptic Ulcer.*

BECTRUP, H.: BRIT. M. J., 2: 20, 1951.

At present there are two criteria for the surgical intervention of severe haemorrhage from peptic ulcer. Pederson indicates surgery if the patient is over 50 years of age; has haematemesis in hospital; and has a recognized ulcer, while Bohn's criteria are a patient over 40 years of age; great loss of blood; good evidence of chronic ulcer, especially ulcer of the corpus; and haematemesis while in hospital. The author studied 17,254 patients with haematemesis and/or melæna during a seven year period. When the mortality of this group is studied by symptoms it is found that 43% died from haematemesis while in

hospital, 43% died from great loss of blood (haematemesis and melæna), 24% died from chronic ulcer, and 33% died with corpus ulcer. Application of Bohn's criteria when two or more are fulfilled gave the most satisfactory results and lowest mortality.

J. A. STEWART DORRANCE

#### *Nonoperative Treatment of Perforated Duodenal Ulcer.*

SEELEY, S. F.: POSTGRAD. MED., 10: 359, 1951.

During the past 20 years improvements in anaesthetics, widespread use of blood transfusions, popularization by Wangenstein of continuous gastric decompression, and the use of antibiotic and chemotherapeutic agents have lowered the morbidity and mortality in many acute inflammatory intra-abdominal conditions, as well as perforated peptic ulcer, treated by both the operative and the nonoperative methods. Complications involving an operative incision are absent in those treated without operation.

Upon admission of a patient suspected to have perforated peptic ulcer, a Levine tube is passed for gastric aspiration, then left lateral decubitus and up-right posture x-rays are taken to note the presence or absence of air between the right lobe of the liver and the diaphragm. On admission to the ward morphine gr.  $\frac{1}{4}$  is given intramuscularly, and blood and urine specimens are obtained. Antibiotics and chemotherapeutics are given intravenously—penicillin, 1,000,000 units; streptomycin, 1.0 gm., and sodium sulfadiazine, 2.5 gm. in normal saline, 1,000 ml., or glucose-water, 5% in 12 hours. This, with continuous gastric decompression is maintained for 5 days. On the 5th to 6th day equal parts of milk and cream are given, 1 oz. per hour, with the Levine tube clamped. Rigidity of the abdomen passes in 12 to 48 hours and peristaltic movements occur on the 2nd or 3rd day.

The basis of this mode of treatment is based on the extreme rapidity with which the body defences are mobilized to counteract the initial onslaught of a perforated peptic ulcer. Operation at the early stages shows that a perforation has been sealed by direct apposition to nearby structures. In such cases operation is of little value and the complications which arise are usually those incidental to incision and exploration. Treatment is continuous effective gastric decompression, combined intravenous antibiotic and chemotherapeutic agents, adequate fluids, and sedation.

J. A. STEWART DORRANCE

#### *Effect of Cigarette-Smoking on Blood Flow Through the Hand.*

SHEPHERD, J. T.: BRIT. M. J., 2: 1007, 1951.

Fifty male subjects inhaled tobacco smoke every 66 seconds, while smoking cigarettes, while on direct questioning they had estimated that they inhaled every 15 seconds. Twenty normal male subjects were studied for the effect of the inhalation of tobacco smoke by simultaneous measurements of hand blood flow, of stethographic records of the respiratory movements during smoking and imitation smoking. When tobacco smoke was inhaled at 1 minute intervals there was a transient decrease in blood flow at the moment of inhalation, similar decreases occurred when the subjects inhaled at the same depth through unlit cigarettes. This transient decrease is due to the physiologic effect of deep respiration associated with the inhalation and is not due to the pharmacological effect of substances in the tobacco. Smoking one cigarette at this rate causes no other changes in the blood flow of the hand. If cigarette smoke is inhaled every 20 seconds, more rapidly than normal, there is a steady decrease in the hand blood flow during the period of smoking. When the cigarette is unlit inhalation causes no decrease in general blood flow. Smoking cigarettes at a rate in excess of normal, therefore causes a decrease in the hand blood flow due to pharmacological and not physiological origin.

J. A. STEWART DORRANCE

*"Water Diuresis" Produced During Recumbency by the Intravenous Infusion of Isotonic Saline Solution.*

STRAUSS, M. B. *et al.*: J. CLIN. INVESTIGATION, 30: 862, 1951.

Following the intravenous infusion of 3,000 ml. of 0.9% saline solution there was a marked increase in urine volume and a decrease in the levels of chloride and sodium in the extracellular fluid, the urine specific gravity was 1.005 or less in the sitting position, and 1.003 or less in the recumbent position. There was a four-fold decrease in the concentrations of ammonia and urea. Other factors, such as alcohol, exposure to cold, and damage to the supra-opticohypophyseal system also cause an excretion of water in excess of solutes. Pitressin inhibits this type of excretion. In patients with heart and liver disease with oedema there are increased excretions of electrolytes and water in the recumbent position due to a redistribution of the isotonically extracellular volume.

J. A. STEWART DORRANCE

*Studies in Diabetes Mellitus. II. The Occurrence of a Diuresis in Diabetic Persons Exposed to Stressful Life Situations, with Experimental Observations on its Relation to the Concentration of Glucose in Blood and Urine.*

HINKLE, L. E. *et al.*: J. CLIN. INVESTIGATION, 30: 818, 1951.

An increase of 200 to 500% in the rate of water excretion may occur in patients with diabetes mellitus when exposed to stressful situations in life, this is also observed in non-diabetics. In diabetics the rate of glucose excreted rises in parallel with the rate of water excreted, hence there is no change in the glucose concentration of the urine. Investigation showed that this diuresis of stress is not dependent upon osmotic changes dependent upon the urine glucose, nor upon variations in blood glucose levels. Rapid depletion of blood chlorides, glucose, and water lead to the onset of acidosis and coma. Diabetic persons, in the absence of stress, tolerate the administration of concentrated glucose, while in stress concentrated glucose increases the loss of chlorides and water.

J. A. STEWART DORRANCE

## ANÆSTHESIA

*Problems of Anæsthesia in Thoracic Surgery.*

GUILD, C. A.: ANÆSTHESIOLOGY, 12: 733, 1951.

The management of anæsthesia for thoracic surgery is probably the most difficult task undertaken by the anæsthetist. The pathological condition of the contents of the chest usually lowers the vital capacity and interferes with adequate oxygenation of the arterial blood. In addition there are often profuse secretions in the tracheobronchial tree which interfere with respiratory exchange and quite frequently the patient is cachectic and anæmic from chronic toxæmia. These conditions make him a poor risk for any anæsthesia or operation.

The many factors predisposing to hypoxia of the patient practically necessitate the routine use of an endotracheal tube in order to maintain an adequate airway at all times and to provide a dependable route for frequent aspiration of secretions throughout the course of the operation. The author favours the use of compensated respiration rather than controlled respiration. Too much positive pressure should be avoided and it should be given intermittently, seldom exceeding 10 mm. of mercury.

Multiple transfusions are frequently necessary to replace blood lost during operation. The anæsthetist should not wait for evidence of circulatory depression before

starting to replace the loss. The presence of a pile of bloody sponges is indication enough for transfusion. Shock is much easier to prevent than to combat once it is established. With a large bore needle in a vein from the start of the operation, fluid and blood replacement can be regulated to parallel their loss.

The author reviews a series of 320 anæsthetic administrations for thoracic operations. The over-all mortality was 6.6%. The mortality for patients with circulatory disease was 8.7%. Ether anæsthesia for patients with congenital heart disease was accompanied by fewer cardiac complications than was cyclopropane anæsthesia.

F. ARTHUR H. WILKINSON

## SURGERY

*Traumatic Asphyxia: Experimental and Clinical Observations with a Report of a Case with Concomitant Paraplegia.*

REICHERT, F. L. AND MARTIN, J. W.: ANN. SURG., 143: 361, 1951.

The startling violet-blue discoloration of the face and neck with subconjunctival hæmorrhages that may be seen in a patient whose thorax and upper abdomen have been suddenly compressed is characteristic. The compression may be the result of being crushed by others in a mob or by being run over by a truck, or by being buried temporarily. It must last two to five minutes to occlude the superior vena cava and cause a sharp rise in venous pressure so that the blood flow is reversed. The discoloration is limited because there are incompetent or no valves in the innominate and jugular veins, and is due to venous stasis with capillary distension, disappearing in a few days. Associated with this may be a motor paralysis of the spinal cord and a case of this is reported.

Experiments with occlusion of the superior vena cava produced similar lesions in anæsthetized dogs.

BURNS PLEWES

*Leg and Thigh Amputations in Obliterative Arterial Disease.*

SHUMACKER, H. B. JR. AND MOORE, T. C.: ARCH. SURG., 63: 458, 1951.

The mortality in major amputation in this disease was very high until within the past few years. The Council on Physical Therapy of the American Medical Association, in 1941, warned against the use of leg amputations and only to a select group of patients and where a good popliteal pulsation was present. With the use of chemotherapy and of antibiotics and improved preoperative preparation of the extremity, more amputations have been attempted at a lower level, hoping for a lessened mortality and an increased usefulness of the stump. The authors discuss their experiences with 128 consecutive leg and thigh amputations on 113 patients with obliterative arterial disease, chiefly of arteriosclerotic and diabetic types. After careful clinical estimates, only 14 of the 113 patients were considered to be in good condition.

A careful evaluation of the circulatory status was made as well, and in 25 cases careful vasomotor response to sympathetic, spinal or peripheral nerve block was made and in 11 instances lumbar sympathectomy was performed in various periods, a few days to months before amputation was done. Spinal anæsthesia was used in 101 of the operations. In the leg amputations short anterior and posterior flaps of about equal length, were used. In thigh amputations longer anterior and shorter posterior flaps were employed. Since 1949, 44 of 69 amputations were through the leg.

Among these amputations the rate was 6.6% and following low thigh amputations, 6%. The over-all operative mortality was 6.25% among the 113 patients.

G. E. LEARMONTH

*Consideration of the Lethal Factors in Acute Pancreatitis.*

SILER, V. E. AND WULSIN, J. H., ARCH. SURG., 63: 496, 1951.

This extensive study covers the ten year period, 1941-1950 inclusive, of 164 patients with acute pancreatitis at the Cincinnati General Hospital. A group of 22 fatal cases upon whom operation or postmortem examination was done, has been studied. The diagnostic criteria in each case were one of the following:

(1) A consistent clinical history in conjunction with increased serum amylase; (2) surgical observation; and (3) postmortem examination. The authors outline the various sub types of this disease. The mortality rate in the 164 cases was 14%. In the past two years this rate was 5.7% in this Hospital. Two-thirds of the fatal cases were in patients over 51 years and 63% were women.

Among the chief symptoms was severe pain chiefly in the upper abdomen, but, occasionally generalized or even in the lower abdomen, from inflammatory reaction in the retroperitoneum. Peripheral circulatory collapse was discovered in 10 of the 22 fatal cases. The authors claim that the diagnosis of acute pancreatitis can be made accurately with the knowledge of the clinical course and with the finding of increased serum amylase. Postmortem examination was made in 20 of the 22 fatal cases. The cause of death was uncertain in any of the authors' series. Fatalities can be prevented by (1) surgical drainage of pancreatic abscesses and (2) the measures to avoid the development of the hæmorrhagic and necrotic forms of the disease. The value of antibiotics in the treatment is emphasized.

G. E. LEARMONTH

## OBSTETRICS AND GYNÆCOLOGY

*Retinal Changes in the Toxæmia of Pregnancy.*

LANDESMAN, R., DOUGLAS, R. G. AND SNYDER, S. S.: AM. J. OBST. &amp; GYNÆC., 62: 1020, 1951.

Ophthalmoscopy is an essential examination in all cases of hyperemesis gravidarum, severe pre-eclampsia and eclampsia. In vomiting of pregnancy superficial transient retinal hæmorrhages do not require interruption of the pregnancy; large retinal hæmorrhages probably constitute a sufficient reason for interruption. Other causes for retinal hæmorrhage with vomiting of pregnancy, such as advanced renal or hypertensive disease, hepatitis, encephalitis and thrombopenia should be considered. Experience indicates an absence of large retinal hæmorrhages and maternal deaths at the New York Lying-in Hospital from hyperemesis gravidarum in the past 16 years.

The slight retinal changes observed in mild pre-eclampsia are of prognostic significance and the findings may be of very considerable value as a base line in the interpretation of subsequent developments. In no cases were Grade II or IV changes noted in the 367 patients with mild pre-eclampsia. The development of spasm or increase in its severity may frequently constitute an indication to terminate the pregnancy. In severe pre-eclampsia retinal vascular changes help to clarify the diagnosis and the severity of the toxæmia. In severe pre-eclampsia Grade II retinal changes suggest strongly that the pregnancy should be terminated. Procrastination to permit further development of the fetus may at times be justified, but the period should not exceed three weeks. In Grade III termination should be performed at the earliest possible time irrespective of the estimated weight of the fetus. The recent improved infant survival rate in severe pre-eclampsia with marked retinal vascular change is related to early interruption. Most infant deaths occur in the group in which the onset of toxæmia is prior to viability.

In eclampsia the findings of normal fundi indicates an excellent prognosis for mother and infant. Grades II and III retinal changes in eclampsia usually indicate previous

renal and hypertensive toxæmia, early onset of the disease and high fetal mortality.

Retinal examination reveals important objective information concerning pregnancy toxæmias, furthers their accurate diagnosis and refines their management.

ROSS MITCHELL

*Uterine Action, Normal and Abnormal.*

NIXON, W. C. W.: AM. J. OBST. &amp; GYNÆC., 62: 964, 1951.

The cervix uteri in early pregnancy has a contractility independent of the uterus and can respond to drugs.

Special histological technique has revealed an "extrinsic" and "intrinsic" musculature in the cervix uteri.

Some of the dangers of prolonged labour are shock, uterine infection and fetal death.

Oxytocic drip infusion is valuable in the treatment of uterine inertia.

A plea is made for an extension of Cæsarean section in the treatment of prolonged labour.

ROSS MITCHELL

*Hæmoglobin Levels Before and After Labour.*

MAGEE, H. E. AND MILLIGAN, E. H.: BRIT. M. J., 2: 1307, 1951.

The Hgb. levels of 2,087 unselected women attending welfare clinics were determined by the grey-wedge method at different times during pregnancy and after delivery. The antenatal curve shows a rapid decline from 93% at the 8th week to a minimum of about 81% between the 32nd and 34th weeks and then a rise to nearly 85% at the 39th week. Comparison of the curve with the levels found in healthy non-parous women of childbearing age suggested that conception causes the Hgb. to rise in the early weeks of pregnancy. The post-natal curve is a straight line, rising from 85% at the 4th to 90.5% at the 65th post-natal week. The values showed more variability than the antenatal ones.

The women who were taking or had recently taken iron had levels 1.7 to 3.6 points higher before labour and 2.8 to 5.8 points higher after labour than women who did not have iron. The longer iron was taken the more effective it was, and the effects persisted into the post-natal period even when nearly all the women had ceased taking it. Repeated pregnancies progressively lowered the Hgb. level. The mean Hgb. level of 43 out of 825 women clinically graded before labour as of poor or fair nutritional state was slightly but not significantly lower than the mean for 782 women of good nutritional state. The mean of 34 out of 843 women graded fair to poor after labour was significantly lower than that of the remaining 809 women graded good.

The systolic blood pressure of women with low Hgb. did not differ from those with high Hgb.

ROSS MITCHELL

## PÆDIATRICS

*Ferrous Sulphate Poisoning in Children.*

SPENCER, I. O. B.: BRIT. M. J., 2: 1112, 1951.

Ferrous sulphate is a very common form of iron medication and is put up in green sugar-coated pills, each containing ferrous sulphate, 3 gr., copper sulphate, 1/25 gr., and manganese sulphate, 1/25 gr. The copper and manganese have no effect but the ferrous sulphate has the irritating and lethal effects when taken in an overdose. The sugar-coating makes these pills particularly attractive to children. Within the first hour the child looks pale and ill, and usually he vomits. Early the vomitus may contain unaltered pills, severe cases will show bright red blood by the third hour, at which time the picture has become fully developed and characteristic. Pallor, coldness, tachycardia, retching, vomiting, and drowsiness or restlessness are constant. The duration of this picture depends upon the number of pills

swallowed—a few hours up to 8 days. Frequently there is hæmatemesis during the first 24 to 48 hours, but it does not lead to excessive blood loss. Diarrhoea is an uncommon feature, possibly the irritating effect is neutralized in the small bowel by the alkaline intestinal juices. The stomach bears the brunt of the initial damage with œdema and congestion with hæmorrhage and necrosis of the crests of the rugæ, this also extends to the proximal part of the small intestine. The liver shows cloudy swelling to areas of necrosis. Serum iron rises to 3.3 to 3.6 mgm. per 100 ml. (normal 0.035 to 0.22 mgm. per 100 ml.) Treatment consists of making the child vomit by salt and water or by gagging; gastric lavage with sodium bicarbonate solution as soon as possible and leaving 10 ounces in the stomach; bismuth carbonate, 3 gr., given four hourly; prevention of the inhalation of vomitus; intravenous therapy to prevent imminent shock; and the following vitamin mixture, aneurin hydrochloride, 10 mgm., nicotinamide, 30 mgm., riboflavin, 10 mgm., tocopherol, 15 mgm., and methionine, 500 mgm. These amounts should be multiplied by the child's age in years and then divided into 3 daily doses.

J. A. STEWART DORRANCE

#### *The Treatment of Acute Poliomyelitis.*

STIMSON, P. M.: J. PEDIAT., 39: 144, 1951.

Mild cases of poliomyelitis without or with slight paralysis may be treated at home as strict isolation does not reduce the contagion. The poliomyelitic patient should have as much rest as possible during the acute phase of the disease (last day or two of incubation and first day or two of fever), hence examinations should be kept at a minimum. Natural sleep should be encouraged without the use of depressing sedatives. Moist heat, is the best treatment for the relief of muscle pain and spasm, applied as hot packs. Quinine may be used to control severe cramps and muscular twitchings. Cerebral œdema, a common occurrence in poliomyelitis may be reduced by I.V. glucose 10% solution given at a rate of 100 to 200 ml. per hour for an adult, and to keep the urine at a specific gravity of 1.025 to 1.030. Breathing difficulties are of two types, due to interference with the central nervous system centre of control and due to interference with the gaseous exchange mechanism, treatment varies accordingly. Secretions must be removed from the upper respiratory tract by aspiration and postural drainage—then and only then may artificial respiration be applied. Upper respiratory positive pressure breathing may lower the cardiac output, but it promotes bronchial drainage and increases the alveolar aeration. Coma, convulsions, delirium and death may result from respiratory acidosis due to carbon dioxide retention and this may be secondary to continuous oxygen therapy via tracheotomy tube. Cases treated in respirators develop bone and muscle atrophy with shortening of the fascia and ligaments about the joints. Passive exercises must be maintained. Tracheotomy is indicated in bilateral abductor paralysis of the vocal cords, or when the respiratory tract cannot be kept clear. Atelectasis commonly complicates respiratory cases and is indicated by dyspnoea, elevated cardiac rate, and a shifting of the cardiac apex to the affected side. The condition may be prevented by intermittent positive pressure artificial respiration. Bulbar cases with dysphagia must be treated by gavage and repeated pharyngeal suction, when the temperature has been normal for 48 hours and the patient appears to be able to swallow, he may be carefully fed at ½ hour intervals. Antibiotics are indicated in patients with respiratory difficulty and a danger of pneumonia, when patients have to be catheterized and when the leucocyte count is elevated as evidence of a secondary infection.

J. A. STEWART DORRANCE

#### *Congenital Heart Disease in Children.*

GIBSON, S.: POSTGRAD. MED., 10: 388, 1951.

The author discusses the 3 most important and common types of cyanotic congenital heart disease. The diagnosis

of patent ductus arteriosus is a clinical diagnosis. There is no other murmur in the entire field of cardiology that quite resembles the continuous murmur which is heard in cases of patent ductus arteriosus. It has a specific location, heard best in the second left interspace, heard almost equally well in the first left interspace, the diastolic phase of the murmur diminishing markedly in the third left interspace. Without this characteristic murmur there is no patent ductus arteriosus, a rubber-stamp type of murmur. The following are also found in patent ductus arteriosus—cardiac enlargement, increased vascularity of the lung fields, high pulse pressure, capillary pulse, and a femoral thud. The only treatment is to ligate the ductus arteriosus. Following operation the child will gain weight, and become a normal citizen. Coarctation of the aorta is characterized by a strong radial and weak femoral pulse, higher blood pressure in the arms than in the legs. A collateral circulation is formed between the branches of the aortic arch and the arteries lower down. This is one of the easiest diagnoses to make in paediatric cardiology, and is rarely missed if the examiner palpates both radial and femoral pulses. This condition occurs in six boys for every girl, and the children are usually husky and present no signs nor symptoms. Very frequently a systolic murmur is heard at the base of the normal sized heart. A pathognomonic sign of coarctation of the aorta is notching or scalloping of the ribs due to erosion by the dilated and tortuous intercostal arteries. The cure is operation and removal of the coarcted area. Double aortic arch is manifested by difficulty in respiration from birth with a distinct wheeze and a croupy metallic cough. Often there is difficulty in feeding. The diagnosis is made by lipiodol of a barium swallow and fluoroscopic observation to note a constriction of the œsophagus, this usually pulsates. The treatment here is ligation of the smaller portion (usually the anterior) of the double aortic arch.

J. A. STEWART DORRANCE

## INDUSTRIAL MEDICINE

### *Industrial Medicine.*

STEWART, D.: BRIT. M. J., 2: 448, 1951.

In this article the author presents his views, drawn from twenty years' experience as a whole-time medical officer in an industrial organization in England, on various aspects in the development of industrial medicine. With no previous knowledge of industry he had entered what was then a strange field of medical practice, his only preparation being certain postgraduate work he had done. Experience in clinical responsibility, teaching, research and, in drafting reports had proved useful. Then too, the implications of an earlier experience, when as resident medical officer in a tuberculosis sanatorium he had assessed tolerance for work, now became clear and indicated to him a possible closer inter-relation between occupation and medicine. After carrying out physical examination of new entrants for a short time he had learned his "first lesson in industrial medicine", namely, that disablement, even of a severe nature, was no bar to employment, provided one knew something of the demands of the job concerned.

The story of rehabilitation is outlined briefly in the article—from the discovery that work was necessary in the treatment of injuries to the present time when official recognition has been given to the problems of the handicapped, and it is the responsibility of the industrial doctor to see that men and women with frank disablement, who have to be employed, are given work within their capacity.

In connection with occupational disease hazards, reference is made to the valuable assistance now available through specially experienced research workers of the Medical Research Council. The feeling of "technical solitude" experienced by the pioneers in industrial medicine was lessened with the birth in 1935, of the Association of Industrial Medical Officers. That a knowledge of

man's occupational background with its wide implications, cannot do other than improve a doctor's efficiency in general practice, is stressed by the author. He cautions, however, that a good general practitioner should not take on too many outside jobs. For the man who wishes to specialize in industrial health, industry has a place. Young socially minded clinicians are needed in factories, mines and other occupational groups, in research and in Government services. Educational facilities are available in several English universities and in the author's opinion, new entrants to this field of medicine should avail themselves of every opportunity to qualify.

MARGARET H. WILTON

*Physical Examination in Industry as a Cancer Case-Finding Procedure.*

SELBY, C. D.: *INDUST. MED.*, 20: 284, 1951.

In this article the author draws attention to the fact that industrial medical examinations are highly specialized and can be used for the early detection of cancer only through the incidentals and by-products coming out of the examination. Cancers of occupational origin are carefully sought and found early, but, generally speaking, the industrial examination cannot give sufficient attention to the areas most frequently involved with cancer—the stomach and prostate in men, and the breast and cervix in women.

There are however, several ways in which cancer detection can be promoted in industrial medical departments and the author draws attention to their importance.

1. *Through the employee-physician relationship.*—Through the intimate contact between doctor and employees, routine services often lead eventually to the early discovery of malignancies. A suspected case can be quickly referred to the family physician or to others who are participating in the cancer-detection program.

2. *By an industrial adaptation of certain features of the Hillsdale Plan for cancer detection.*—The Hillsdale Plan established by a group of practising physicians in Hillsdale County, Michigan, is to encourage the people of that County to voluntarily request cancer examinations from their family physicians. This is a complete examination given by the physician in his office at regular office fee with special attention to sites where cancer is most frequently found. The name of patients enrolling, together with a report of the findings, are sent to the local health department, thus providing a basis for a cancer register. Although every industrial medical department can be potentially a cancer-detection centre, the plant physician is limited in certain cases, especially in women. He can, however, refer employees to their own physicians as provided in the Hillsdale Plan. In this way industrial medicine becomes a feeder for practitioners who are participating in cancer detection.

3. *Education.*—This can be most helpful in attracting employees to consult the plant doctor. The author quotes from an employees' magazine in Milwaukee to show how one doctor presented information to arrest the workers' attention.

MARGARET H. WILTON

## FORTHCOMING MEETINGS

### CANADA

AMERICAN COLLEGE OF SURGEONS, Sectional Meeting, Vancouver, B.C. (Dr. H. P. Saunders, 40 E. Erie St., Chicago 11, Ill.) March 31 to April 2, 1952.

AMERICAN COLLEGE OF SURGEONS, Sectional Meeting, Royal York Hotel, Toronto, Ont. (Dr. H. P. Saunders, 40 E. Erie St., Chicago 11, Ill.) May 15-17, 1952.

CANADIAN MEDICAL ASSOCIATION, Annual Meeting, Banff Springs Hotel, Banff, Alberta. (Dr. T. G. Routley, 135 St. Clair Ave., West, Toronto 5, Ont.) June 9-13, 1952.

SOCIETY OF OBSTETRICIANS AND GYNÆCOLOGISTS OF CANADA, Annual Meeting, Banff Springs Hotel, Banff, Alberta. (Dr. G. A. Simpson, Secretary, Royal Victoria Hospital, Montreal, Que.) June 6-8, 1952.

CANADIAN PUBLIC HEALTH ASSOCIATION, Annual Convention, Fort Garry Hotel, Winnipeg, Man. (Canadian Public Health Association, 150 College St., Toronto 5, Ont.) June 15-18, 1952.

QUEBEC DIVISION C.M.A., Annual Meeting, May 2-3, 1952, North Hatley, Que. (Dr. G. W. Halpenny, Secretary, 1538 Sherbrooke St. W., Montreal.)

### UNITED STATES

POSTGRADUATE ASSEMBLY AND CONVENTION, sponsored by the Alumni Association of the College of Medical Evangelists School of Medicine, Biltmore Hotel, Los Angeles, Calif. (Dr. G. E. Norwood, School of Medicine of the College of Medical Evangelists, 312 North Boyle Ave., Los Angeles 33.) March 2-4, 1952.

AERO MEDICAL ASSOCIATION, 23rd Annual Meeting, Washington, D.C. (Dr. T. H. Sutherland, 214 S. State St., Marion, Ohio.) March 17-19, 1952.

AMERICAN PSYCHOSOMATIC SOCIETY, 9th Annual Meeting, The Drake, Chicago, Ill. (American Psychosomatic Society, 551 Madison Ave., New York 22, N.Y.) March 29-30, 1952.

AMERICAN CONGRESS ON OBSTETRICS AND GYNÆCOLOGY, 5th Congress, Netherland Plaza Hotel, Cincinnati, Ohio. (Mr. Donald F. Richardson, Executive Secretary, American Committee on Maternal Welfare, 116 South Michigan, Chicago 3, Ill.) March 31 to April 4, 1952.

AMERICAN GOITRE ASSOCIATION, Annual Meeting, St. Louis, Missouri, May 1-3, 1952.

AMERICAN ASSOCIATION FOR THORACIC SURGERY, Baker Hotel, Dallas, Texas, May 8-10, 1952.

NATIONAL TUBERCULOSIS ASSOCIATION AND ITS MEDICAL SECTION, The American Trudeau Society, Annual Meeting, Statler Hotel, Boston, Mass. (Dr. H. L. Mantz, 1103 Grand Ave., Kansas City, Mo.) May 26-29, 1952.

AMERICAN COLLEGE OF CHEST PHYSICIANS, 18th Annual Meeting, Congress Hotel, Chicago, Ill. (Executive Offices, American College of Chest Physicians, 112 E. Chestnut St., Chicago 11, Ill.) June 5-8, 1952.

AMERICAN MEDICAL ASSOCIATION, Annual Session, Chicago, Ill. (Dr. George F. Lull, 535 N. Dearborn St., Chicago 10, Ill.) June 9-13, 1952.

AMERICAN UROLOGICAL ASSOCIATION, Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N.J. (Dr. Charles H. DeT. Shivers, Boardwalk, National Arcade Bldg., Atlantic City.) June 23-28, 1952.

### OTHER COUNTRIES

INTERNATIONAL COLLEGE OF SURGEONS, Madrid, Spain. (Dr. Max Thorek, 850 West Irving Park Road, Chicago, Ill.) May 20-24, 1952.

CONGRESS ON DIABETES MELLITUS, The International Diabetes Federation, Leyden, Netherlands. (Dr. F. Gerritzen, 33 Prinsegracht, The Hague, Netherlands.) July 7-12, 1952.

BRITISH CONGRESS OF OBSTETRICS AND GYNÆCOLOGY, 13th Congress, Ripley Smith Hall, University of Leeds, Leeds, England (Dr. B. Jeaffreson, The Hospital for Women, Coventry Place, Leeds, Yorkshire.) July 8-11, 1952.

COMMONWEALTH AND EMPIRE HEALTH AND TUBERCULOSIS CONFERENCE, 3rd Conference, Central Hall, London, England. (Secretary General, National Association for the Prevention of Tuberculosis, Tavistock House North, Tavistock Square, London, W.C.1) July 8-13, 1952.

INTERNATIONAL CONGRESS OF RADIOLOGY, 7th Congress, Copenhagen, Denmark, July 14-19, 1952.

INTERNATIONAL CONGRESS OF PHYSICAL MEDICINE, London, England. (Dr. A. C. Boyle, 45 Lincoln's Inn Fields, London, W.C.2) July 14-19, 1952.

INTERNATIONAL CONGRESS OF DERMATOLOGY, 10th Congress, London, England. (Dr. G. B. Mitchell-Heggs, St. Johns Hospital, Lisle St., Leicester Square, London, W.C.2) July 21-26, 1952.

INTERNATIONAL UNION AGAINST TUBERCULOSIS, 12th Congress and the International Congress on Diseases of the Chest, 2nd Congress, sponsored by the Council on International Affairs of the American College of Chest Physicians, Rio de Janeiro, Brazil. (Executive Officer, American College of Chest Physicians, 112 E. Chestnut St., Chicago 11, Ill.) August 24-30, 1952.

INTERNATIONAL CONGRESS ON NEUROPATHOLOGY, Rome, Italy (Dr. Armand Ferraro, 722 W. 168th St., New York) September 8-13, 1952.

INTERNATIONAL CONGRESS OF INTERNAL MEDICINE, Friends House, London, N.W.1, England. (Sir Harold Boldero, 12 Pall Mall East, London, S.W.1) September 15-18, 1952.

NEURORADIOLOGIC SYMPOSIUM, Stockholm, Sweden (Docent Ake Lindborn, Serafimerlasarettet, Stockholm K, Sweden.) September 17-20, 1952.

## NEWS ITEMS

### ALBERTA

From the pen of Dr. G. D. Stanley comes a book entitled "Fun in the Foothills". This fine expression of the past with his and other men's experiences in South Alberta country is amusing and fascinating indeed. Were it possible that many more were able to put in print some of the amusing experiences of medical practice much good reading material would be at hand. It is hoped that more medical men in Canada develop a similar type of hobby.

Preparations are on their way for a grand meeting of the Canadian Medical Association in Banff this year. All members are encouraged to attend and to have their entitled leisure in this beautiful setting of the Rockies.

Dr. J. C. O'Brien of Coronation is recovering nicely following a "thin red line" made by an Edmonton surgeon. We wish Dr. O'Brien an early return to his extensive practice.

Dr. Percy H. Sprague of Edmonton has taken up offices in the Glenora Building. Dr. Sprague is the immediate past-president of the Alberta Medical Association.

Dr. Morris Weinlos and Dr. Phillip Mousseau of Edmonton attended the International Surgical Society meeting in Paris in November. This is a fine surgical meeting held each year on the Continent.

W. CARLETON WHITESIDE

### BRITISH COLUMBIA

The newly re-organized B.C. Division of the Canadian Medical Association is now hard at work. Since the beginning of the year, there have been several changes in the organizational set-up of medicine in B.C.: chiefly in the matter of medical economics. Hitherto the Council of the College of Physicians and Surgeons has assumed responsibility for this, in the absence of a body

that could do so efficiently, but the profession of B.C. decided by ballot that it would prefer to have this handled by the B.C. Division, whose organization is now so arranged that it can undertake the task.

Membership in the new Division, as in the C.M.A. is voluntary, but there appears to be no doubt that it will quickly expand. The plans of the Division include the employment of a full time Executive Secretary and the rapid development of working committees.

The Council, in an effort to facilitate this work, and in support of the decision of the College to make these changes, has reduced its fees by as large an amount as is at present possible—has placed all its files, information etc., at the disposal of the Division, and has offered to help in every way possible.

The reduction in fees represents the amount that was expended formerly in the work of the Council on medical economics.

At the Annual meeting of the B.C. Section of the Canadian Red Cross, held lately, reports were given showing very satisfactory progress. Some 5,009 donors gave 15,295 pints of blood during the year—an increase of 2,662 over the number in 1950. The Red Cross has its seasonal difficulties, but in some magical way seems always to surmount them. It is very doubtful if the public appreciates at all adequately the immense amount of work and devotion bestowed by those who are in charge of this most noble undertaking.

Lately, there has been a great deal of correspondence in the press and general activity aimed against the use of animals by the University of British Columbia, in connection with the work of the Medical Faculty and its Research departments.

These animals, mainly dogs, are obtained from the pound, and are in any case fated for destruction as unclaimed strays. The Dean of the Medical Faculty, Dr. M. M. Weaver, has been at pains to explain publicly that every precaution is taken to avoid suffering, and has endeavoured to make clear what informed persons all know, that animal experimentation is absolutely essential to progress in medical science. But there is still a very vocal minority that on all possible occasions protests vigorously against these procedures.

Hospital rates throughout the province have increased, as from January 1, and the increase has been approved by the B.C. Hospital Insurance Scheme. The average rise is 17%. The main reason for the increase, states the Hon. A. D. Turnbull, Minister of Health and Welfare, is the increase in wages paid to hospital employees. Mr. Turnbull added that the increases are temporary adjustments until hospital budgets have been revised, and the future policy determined by the Legislature.

The report that will be made to the B.C. Legislature by the Legislative Committee appointed last year to study Hospital Insurance, is being eagerly awaited in British Columbia. It will be made at the Session of the Legislature which opens late in February. One hears many "well authenticated" rumours about this but the Committee has said nothing yet for publication, and nobody will know anything till the House has been given the report.

Dr. Karl S. Alstad, formerly associated with the Vancouver Chest Clinic centre of the B.C. Department of Health, has been appointed physician in charge of the Victoria Tuberculosis Unit, replacing Dr. F. O. R. Garner, who is now Medical superintendent of Tranquille Sanatorium. Dr. Alstad was born in Scotland, and holds the degrees of M.D.(Glas.), B.Sc., and D.P.H. He has worked in public health in Scotland and New Zealand.

Efforts are being made to secure the establishment of a government treatment centre for alcoholics. A civic delegation from Vancouver headed by Alderman Anna

Sprott waited on officials of the Health Department and the Attorney-General's department. Dr. Stewart Murray, Medical Health Officer for Vancouver and Mr. J. I. Chambers, administrator of social services, accompanied the delegation. The question has already been under consideration by the Government, according to a statement reportedly made by the Hon. W. T. Straith, Provincial Secretary.

A new 259-bed, chronic and convalescent hospital, to be built in South Vancouver, is now contemplated. It will be operated by the Roman Catholic Sisters of Providence, whose mother house is in Kingston, Ontario. It will be called "Holy Family Hospital" and its construction is, we are informed, to start very soon. It will be welcomed most heartily by all who have to deal with hospitals, and should do a great deal to relieve the present very distressing lack of facilities for dealing with those who, while not needing active hospital treatment, yet require institutional care. J. H. MACDERMOT

### MANITOBA

A new hospital at Elkhorn, Manitoba, is nearing completion. It will have eight beds, a three-bassinet nursery and living quarters for the nursing staff. It will serve a community of over 2,000 people.

The students' reading room in the Medical Library is now graced with numerous engravings illustrating historical medicine. They are the gift of Dr. J. D. Adamson to the Medical school and represent a collection made through years.

The Canadian Association of Radiologists held a three day annual meeting at the Fort Garry Hotel January 16, 17 and 18. The session on the afternoon of January 18 was devoted to Cobalt 60. It is expected that a bomb of Cobalt 60 (the third in Canada) will be brought to Winnipeg within a few months.

The council of Winnipeg is considering fluoridation of its water supply. The Winnipeg Dental Society has gone on record as favouring the idea. On January 18, Dr. Morley Loughheed, city health officer, addressed the Civics Bureau of the Chamber of Commerce on that subject.

The newly formed Medical-Legal Society held its first meeting in Kelvin School auditorium on January 22 when Chief Justice E. K. Williams spoke on "Doctors and the Law". ROSS MITCHELL

### NEW BRUNSWICK

On New Year's Day Lieut. Governor D. L. McLaren invested Dr. W. W. White with the insignia of a Knight of Grace of the Venerable Order of the Hospital of St. John of Jerusalem. Dr. White has just passed his 89th birthday and has been confined to his home for some time. Dr. G. B. Peat, a commander brother of the order, was present at the ceremony.

Dr. Wilfred Depow was chairman of a meeting of the Carleton Victoria Medical Society on January 16, 1952, at Bath when cases were presented as follows: Dr. Everett Reid of Plaster Rock reported an interesting case of intractable post partum hæmorrhage, treated by hysterectomy and a second case of extra-uterine gestation following a uterine perforation. Dr. H. H. MacKinnon of Fredericton spoke on the interpretation of cardiac symptoms and signs. Other out of town visitors included Dr. W. A. Farrell, Radiologist of Fredericton and Dr. Fred Whitehead, secretary of the N.B. Medical Society.

Dr. R. D. Roach of Moncton is confined to his home by illness.

The N.B. Division of the Canadian Association of Radiologists met in January at St. Joseph's Hospital, Saint John, under the chairmanship of Dr. Howard Ripley of Moncton. Discussions of training of x-ray technicians, cancer program in New Brunswick and malpractice insurance were features. Dr. Ripley represents New Brunswick on the executive of the Canadian Association of Radiologists.

Dr. G. B. Peat has been re-appointed to the Board of Commissioners of the Saint John General Hospital.

Dr. D. A. McLennan was recently elected to the council of the town of Campbellton.

Dr. A. W. Ross was chairman at the monthly meeting of the Moncton Medical Society in January. The evening was devoted to a symposium on Surgical Thyroid. Dr. Ian MacLennan discussed the pathological aspects. Dr. E. D. Lettivan spoke on preoperative care while Dr. R. B. Eaton outlined the indication for surgery and the techniques used and Dr. F. J. Hogg completed the discussion by indicating the more common complications. This meeting was held in the Hotel Dieu Hospital.

A. S. KIRKLAND

### NOVA SCOTIA

Latest step in the Provincial battle against tuberculosis is the installation of miniature x-ray equipment for mass chest radiography in the Colchester County Hospital, Truro, the Halifax Infirmary, The Glace Bay General Hospital and St. Joseph's Hospital, Glace Bay. Hon. Harold Connolly, Minister of Public Health and Welfare stated that the installations were made possible through Federal-Provincial health grants. The health department will also cover the cost of film and normal maintenance of equipment.

Besides discovery of pulmonary tuberculosis which might otherwise go unrecognized for long periods mass radiography is valuable in picking up re-infection and reactivation cases long since considered healed. In recognizing early and often open cases on admission to hospital the greatest possible advance is being made in the protection of nursing personnel who have, through the years, ranked high among tuberculosis victims. Experience at the Victoria General Hospital, where mass radiography has been practised for some years, has been that an unexpectedly large number of other pulmonary conditions, both neoplastic and bacterial in origin, have been discovered at a stage where clinical signs were slight, if at all, and clinical history was negative.

Dr. James Robert Feindel (Dal. '43) is serving with the Royal Canadian Army Medical Corps, attached to the 25th Canadian Infantry Brigade in Korea. Re-entering the Canadian Army after his graduation last year Dr. James A. Lewin is attached to the 1st Division of the Princess Pats with whom he is taking a special paratroopers course.

Dr. James Tompkins, (Dal. '51) is associated in practice at Dominion with his father, Dr. M. G. Tompkins.

Dr. Sydney Gilchrist, (Dal. '27) has recently returned on furlough from Portuguese West Africa. Dr. Gilchrist is spending the great part of his holiday in postgraduate study after which he will return to his chosen field.

Dr. Eliza P. Bryson, psychiatrist to the Department of Public Welfare, has retired after more than twenty years of distinguished and faithful service. Dr. Bryson's work

with backward children, a field where medical science can offer so little but warm humanity and motherly zeal can accomplish so much, was outstanding. A presentation was made to Dr. Bryson in honour of her work.

To devise improved means of practical assistance in the rehabilitation of tuberculous persons of little academic training and no usable trade the Rehabilitation Division of the Nova Scotia Department of Public Health is opening a campaign of development and productivity.

ARTHUR L. MURPHY

## ONTARIO

The President of the Homewood Sanitarium of Guelph, Ontario, Canada, announces the retirement of Dr. F. H. C. Baugh, graduate of Queen's University, 1922, as Medical Superintendent on account of ill health. Dr. A. L. MacKinnon, a graduate of University of Toronto, 1924 and formerly Assistant Medical Superintendent, has been appointed to succeed Dr. Baugh, and Dr. G. S. Burton, a graduate of Queen's University, 1931, of the Homewood Sanitarium staff has been appointed Assistant Medical Superintendent.

Dr. Clifford L. Ash has been appointed director of the Ontario Cancer Institute. He graduated from the University of Alberta in 1930 with the degree of Bachelor of Science, then took his M.D. from University of Toronto. He received a diploma in radiology from University of Toronto in 1940 he then served as radiologist at Toronto General Hospital. In 1949 he became senior radiologist of that hospital.

Dr. Ash's services will be immediately available on a part-time basis to assist the architects in planning the building which is to be erected immediately adjacent to Wellesley division of Toronto General Hospital. He will not assume full-time duties as director of the Institute until the new building is completed.

The Registered Nurses' Association of Ontario has announced that a course in civil defence nursing will shortly be available to every Ontario nurse. A federal team, consisting of two nurses, a doctor and physicist, gave a four-day nursing course for atomic, bacteriological and chemical warfare in Toronto last November. Eighty-seven nurses from all parts of Ontario attended. These nurses are now prepared to conduct 12-hour courses for other nurses. The advisory committee on nursing services of the Toronto and York County Civil Defense Organization will arrange for these courses to be available to every nurse in Ontario.

A portrait of the late Dr. Marion Kerr was presented to Women's College Hospital by her two daughters. Dr. Kerr served as head of the Department of Obstetrics and Gynaecology from 1926 until 1947, and on retirement, continued as a member of the hospital's consulting staff until her death last March.

Willowdale Hospital Limited has been established just north of Toronto. It is a new type of private hospital for women, licensed to engage in the treatment of neurosis, psychosomatic disease and alcoholism. The treatment of all patients must be supervised by a psychiatrist who has qualified for his specialty with the Royal College of Physicians and Surgeons of Canada. This is in accord with a new regulation of the Private Hospitals Act for the Province of Ontario. Dr. R. G. Bell is the medical director.

A refresher course in Paediatrics was being given at the Hospital for Sick Children by the Ontario Medical Association and the University of Toronto on February 11, 12 and 13.

The University of Toronto has announced the following awards: R.C.A.M.C. Women's Auxiliary Bursary to R. C. Rhodes; The Baptie Scholarship to E. M. Culp;

the B'Nai B'Rith Scholarship to A. N. Lofchy; Scottish Rite Masons' Bursary to J. C. Stears; Medical Alumni Association Scholarships to P. Freeman, G. Y. Hiraki, J. C. Stears, M. E. Miller, H. J. Hoffman; G. Roy Sproat and Katherine Sproat Bursaries to R. F. Brown, P. D. McCarthy, M. Resnick; Charles E. Frosst Scholarship to P. S. Rosen, George Armstrong Peters Prize to Dr. R. O. Heimbecker.

The National Sanitarium Association is launching an experimental survey in diabetes detection in the area of York and Simcoe counties and Parry Sound and Muskoka Districts. This study has the approval of the Ontario Medical Association Board of Directors. The National Sanitarium Association will refer patients from the survey to family physicians for further investigation.

The *Ontario Medical Review* staff held a Medical Journalists' Conference in Toronto on January 25. About sixty people attended, including Dr. Austin Smith, editor, *Journal American Medical Association*, Dr. H. E. MacDermot, editor, *Canadian Medical Association Journal* and Dr. Lloyd G. Stevenson, assistant professor of medical history, University of Western Ontario. Ten undergraduates from University of Ottawa, University of Western Ontario and University of Toronto came to the meetings. Dr. J. C. B. Grant, professor of anatomy, University of Toronto, addressed the dinner meeting on British Place Names.

LILLIAN A. CHASE

## PRINCE EDWARD ISLAND

Dr. O. H. Curtis, D.P.H., the Provincial Chief Health Officer, was recently appointed Deputy Minister of Health and Welfare, and is at present carrying on in both capacities.

Dr. A. A. MacVicar has recently arrived in the Province to join Dr. John Theriault in psychiatric work at Falconwood Hospital. Dr. A. Murchison, the Superintendent of Falconwood Hospital, is welcomed back after a year in Essondale Hospital in British Columbia in postgraduate work.

Dr. T. A. Laidlaw, F.R.C.S., of Charlottetown recently attended the Annual Meeting of the Royal College of Physicians and Surgeons in Quebec City.

It is the consensus of the Island Medical profession that our first Annual Meeting lasting two days in which we had the privilege of enjoying President Dr. H. B. Church and his team of clinical speakers, was such a success that we are planning on the same two day program already for the coming year.

Dr. J. H. Shaw was recently in Ottawa at the Annual Meeting of the Provincial Laboratory directors.

J. K. L. IRWIN

## SASKATCHEWAN

The Moose Jaw and District Medical Society held a dinner meeting on Thursday, November 22 which was well attended. The Registrar of the College was guest at the meeting.

Construction and alterations to the Lloydminster Hospital are now complete providing an additional thirty-six beds. A new forty-three bed wing has been completed and with alterations to the old building provides a total of eighty-five beds.

Dr. F. E. Werthenbach has been asked to represent the profession on the Board of Directors of the Canadian Arthritis and Rheumatism Society, Saskatchewan Division. The Society is active in this Province and has a well selected Board.

The Regina and District Medical Society had their Christmas banquet in the Hotel Saskatchewan, Regina on Friday, December 21. Although there was no formal program the guest of honour was Dr. F. D. Mott who was leaving the next day to take up residence in Washington, D.C. Dr. W. A. Dakin, on behalf of the doctors of Regina, presented Dr. Mott with a silver cigarette case.

The Saskatoon and District Medical Society had its Christmas party on Saturday night, December 15. This part took the form of a buffet supper in the Bessborough Hotel and doctors and their wives had a fine meeting together. There was no program in the form of the usual lectures or business but the members were entertained by the Saskatoon Medical Societies' "Short Haired" Orchestra. Original songs were presented to familiar music.

Elections to the Council of the College of Physicians and Surgeons took place on December 12, 1951. Dr. A. J. McDougal was re-elected and Dr. J. B. Ritchie of Regina was elected to his first session. Dr. C. L. Tisdale of Prince Albert was elected by acclamation for his first session and Dr. R. A. Lewis of Vanguard was re-elected by acclamation.

The new Council held its first meeting in Saskatoon on January 12 and 13. Dr. H. Gordon Young of Moose Jaw was elected President for the year 1952; Dr. F. E. Werthenbach was elected First Vice-president and Dr. A. J. McDougal as Second Vice-president. Dr. J. E. McGillivray is the retiring President.

Nine members of the profession who have practised medicine in the Province of Saskatchewan for forty years were honoured by the incoming Council through granting to them Senior Life Membership. The nine doctors are: J. E. Bloomer, Moose Jaw; W. A. Dakin, Regina; E. R. Graham, Luseland; L. H. McConnell, Saskatoon; H. M. Young, Moose Jaw; A. C. Scott, formerly of Indian Head; D. Sweeney, Regina; G. F. Nelson, Saskatoon; W. G. Mainprize, Midale.

New officers of the Prince Albert and District Medical Society were elected at an organizational meeting held on January 7. Their new officers are: Honorary President—Dr. D. P. Miller; President—Dr. T. J. Ho; Vice-president—Dr. W. H. Fry; Second Vice-president—Dr. P. J. Rich; Secretary—Dr. J. C. Day; Local Executive—Drs. G. P. S. Powles and C. H. Andrews; District Executive—Drs. K. H. L. Scougall and J. H. Schropp.

G. GORDON FERGUSON

## GENERAL

*The Osler Medal.*—The American Association of the History of Medicine has established a Medal in memory of Sir William Osler that will be granted annually to the author of the best student essay submitted to the Association. Essays that are the result of original research will be given preference, but the Association will also consider essays which show an unusual appreciation and understanding of medical problems. Essays must be sent before April 15, 1952, to Dr. Benjamin Spector, 136 Harrison Ave., Boston 11, Mass.

It is of interest that the first two medals granted in this competition were won by members of the Osler Undergraduate Society of McGill. One of these was Dr. Honor Kidd of Vancouver, who in the same year also had the distinction of being the first woman to be admitted to membership in that Society.

H. R. H. the Princess Elizabeth has presented \$7,000 to the King George V Silver Jubilee Cancer Fund. The gift is made up of monies presented to the Princess during the recent royal tour for donation to her favourite charities. The gift includes \$5,000 from the Province of

Manitoba and \$1,000 each from the Province of Prince Edward Island and the City of Ottawa. The Princess has indicated that she "is most happy to think that this money given to her, so generously, when she was in Canada is to be used for cancer research."

The King George V Silver Jubilee Cancer Fund was set up in 1935 by Her Excellency the Countess of Bessborough to assist in the improvement of facilities for the diagnosis and treatment of cancer, to carry out research and to develop a program of public education on cancer control. The fund is administered by a board of trustees headed by the Chief Justice of the Supreme Court.

The Robert Roesler de Villiers Foundation, Inc. of 417 Park Avenue, New York 22, N.Y. with the co-operation of the International Society of Haematology and the Société Internationale Européenne d'Hématologie, is offering an award of \$1,000 for the most important paper that presents a significant contribution to the knowledge of leukaemia. This prize will be increased to \$1,500 according to the practical value of the paper and to \$5,000 for a cure or a therapy which will keep the patient alive and enable him to live more or less normally as insulin does for the diabetic patient. This award will be given to a research man at a hospital or laboratory or to an individual worker here and abroad—whichever submits the significant contribution which the contest is seeking.

Papers to be considered for the contest shall have been either published or accepted for publication by a reputable journal in or outside of the United States of America between January 1, 1951 and October 20, 1952. Papers published prior to January 1, 1951 shall be ineligible for submission hereunder.

*WHO Medical Teaching Mission to Visit Burma, Ceylon, India.*—A World Health Organization team of eleven eminent medical scientists from seven countries will shortly visit Burma, Ceylon and India to work with medical-education projects similar to those so successfully done last year in the Middle East.

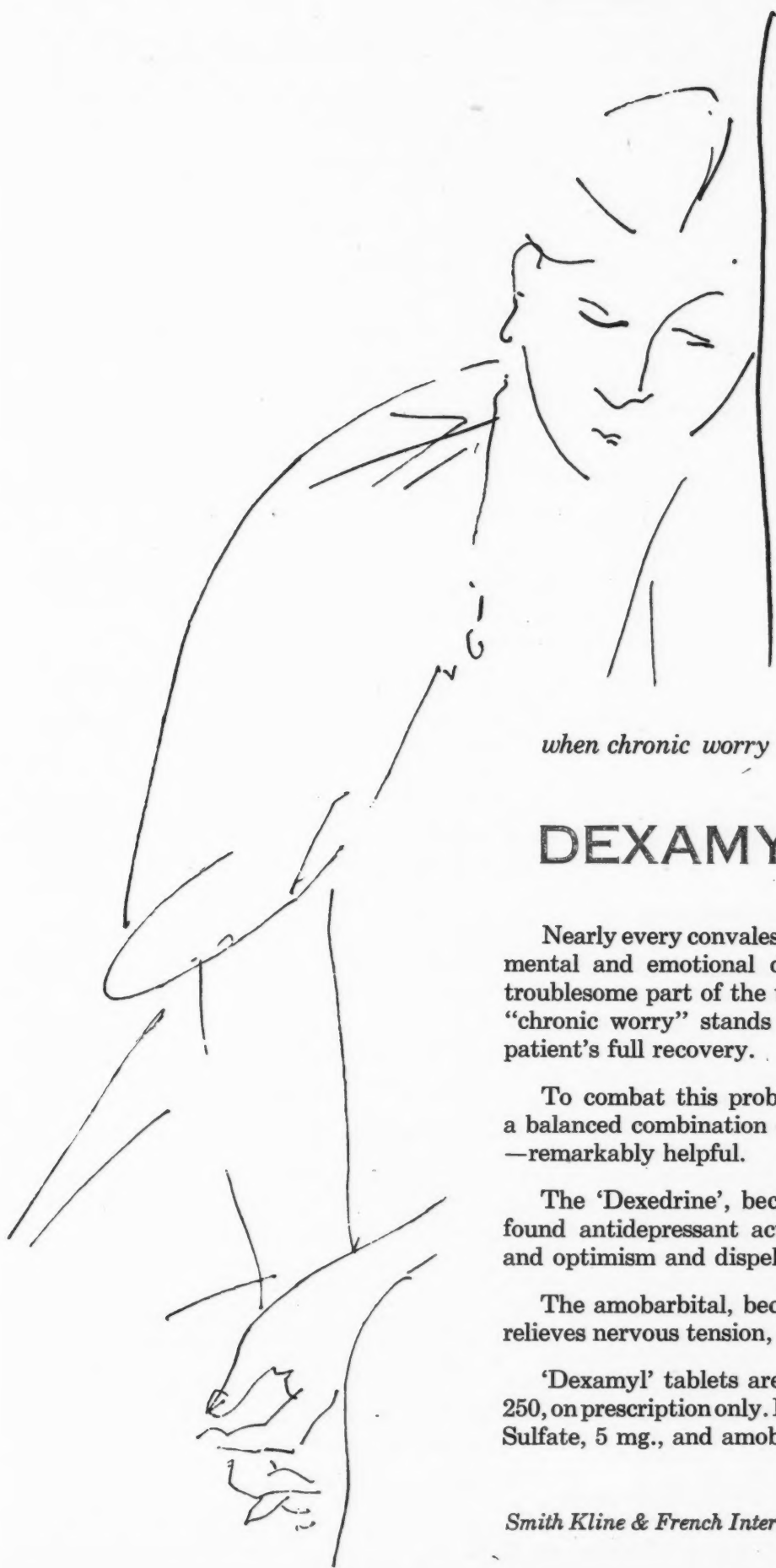
The visits, which are being organized by WHO in co-operation with the West Bengal, Burmese and Ceylon governments, will have three main purposes: exchange of information with local medical specialists; lectures and demonstrations on new advances in medical techniques; and discussion of problems relating to medical education in the host countries. In addition, the visiting scientists will advise in their special fields in such advice is expressly sought by host governments.

Among the members of this international team we note the name of Dr. M. R. MacCharles, Associate Professor of Surgery, University of Manitoba.

*Pharmacologists Recommend that Heroin be no Longer Used.*—To protect public health and safety an international pharmacologists group has recommended that diacetylmorphine (heroin) no longer be used for medical purposes, and should be replaced in all countries with other, less dangerous drugs.

The World Health Organization's expert group on narcotics, which meets regularly to advise on problems connected with drug addiction, also examined the addictive properties of some 15 new synthetic substances, several of which are already on the market. The substances examined belong to the pethidine, methadone and morphinan types and are potent analgesics. Thirteen of these drugs should be under international control, the experts recommended. This, they said, should be done through machinery provided by the United Nations under various international conventions.

The recommendation on heroin was taken after the expert group learned that, on the World Health Organization's request, 50 countries have already discontinued or are willing to discontinue the medical use of heroin. As recently as 1949, available data indicated that only 24 countries had taken this step.



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It is proposed to hold an International Congress on Medical Librarianship in London in July, 1953. Request for further information may be addressed to the Honorary Secretary, First International Congress on Medical Librarianship, c/o The London School of Hygiene and Tropical Medicine, Keppel Street, London W.C.1.

*WHO Director-General Points out that Family Planning does not Conflict with Roman Catholicism.*—The following statement has been issued in Geneva by Dr. Brock Chisholm, Director-General of the World Health Organization.

"Misleading statements have been currently made concerning WHO and studies in family planning to be carried out by the Indian Government, following recommendations of an expert consultant engaged by WHO. These misrepresentations have caused concern, especially to adherents of the Roman Catholic Faith.

"I therefore wish to state that the so-called 'Rhythm-Method' of family planning (on which the Indian Government requested the advice of WHO) does not under clearly specified circumstances conflict with the teaching of the Roman Catholic Church. Confirmation of this will be found in the addresses of Pope Pius XII as reported in *Il Osservatore Romano* of October 29 and 30 and November 29 last.

"From these it is clear that the Roman Catholic Church does not forbid this method of family planning, so long as it is justified by medical, economic or social reasons.

"The request by the Indian Government for provision—through a WHO consultant—of family planning advice is directly due to the threat to India's food supplies caused by rapid population growth. The increase is estimated at 23,000,000 in the past five years."

## NEWS OF THE MEDICAL SERVICES

### *Canadian Armed Forces*

The following Naval Medical Officers have received promotions during the past few months: To Surgeon Commander—R. H. Roberts, R.C.N., Principal Medical Officer, *H.M.C.S. Magnificent*. J. D. Ross, R.C.N.(R.), *H.M.C.S. Nonsuch*, Edmonton, Alberta. To Surgeon Lieutenant Commander—W. M. Little, R.C.N., now on course at the Toronto Western Hospital.

The following United Kingdom physicians were recently appointed to commissions in the Canadian Army Active Force: Captain D. E. Yates; Captain L. S. Glass; Major J. D. Randall; Captain J. K. Hampshire; Captain W. E. Watson; Captain G. H. D. Evans; Captain D. D. McGrath; Captain S. J. O'Rourke.

In accordance with the rotation policy for personnel serving in the Far East, Lieut.-Col. J. E. Andrew, Majors W. Fowler, and J. R. Feindel, and Captain H. C. Stevenson have returned to Canada after serving a tour of duty in Japan and Korea and Majors A. C. Derby, A. B. C. Powell, and J. F. Evans and Captains C. W. Chapman, T. H. McLennan and D. M. Kreutz have been posted to the Eastern Theatre as replacement medical officers.

Arrangements have been completed by Lieut.-Col. C. G. Wood, O.B.E., C.D., Command Medical Officer,

Prairie Command, for periodic visits of medical and surgical consultants to Fort Churchill Military Hospital. The object of these visits is to provide the hospital staff with access to expert opinion in doubtful cases without the necessity of evacuation to Winnipeg; to carry out diagnosis and treatment as may require specialist knowledge; to bring the hospital staff up to date in regard to the latest developments in various fields of medicine and surgery; and to acquaint these specialists, who are on the staff of Deer Lodge Hospital, D.V.A., of the treatment facilities afforded at Fort Churchill with a view to earlier discharge of military patients from the former institution to convalesce at their own station. The schedule of visits for the period November, 1951 to April, 1952 is as follows: November 13, 1951, Dr. D. L. Scott, Diseases of the Chest; November 27, 1951, Dr. Alexander Gibson, Orthopaedics; December 11, 1951, Dr. C. E. Corrigan, General Surgery; January 8, 1952, Dr. C. Henneberg, Obstetrics and Gynaecology; January 22, 1952, Dr. W. C. Guest, Ophthalmology; February 4, 1952, Dr. J. D. Adamson, Internal Medicine; March 5, 1952, Dr. T. E. Holland, General Surgery; April 6, 1952, Dr. E. W. Stewart, Obstetrics and Gynaecology; April 22, 1952, Dr. D. Nicholson, Pathology.

Major A. G. McLaren, The R.C.A.M.C. School, Camp Borden, has been promoted to the rank of Lieutenant-Colonel and appointed Officer Commanding Kingston Military Hospital.

Major N. H. McNally, formerly Officer Commanding, Kingston Military Hospital, has been promoted to the rank of Lieutenant-Colonel and appointed Officer Commanding, Canadian Section, British Commonwealth Hospital, Kure, Japan.

Lieut.-Col. J. E. Andrew, E.D., R.C.A.M.C., formerly Officer Commanding, Canadian Section, British Commonwealth Hospital, Kure, Japan, has been appointed Officer-in-Charge Surgery, Toronto Military Hospital, on his return to Canada.

Major W. Fowler, R.C.A.M.C., who has recently returned from a tour of duty in Korea, has been appointed Command Hygiene Officer, Central Command, Oakville, Ontario.

The promotion of the Director of Medical Services, R.C.A.F. to the rank of Air Commodore was announced recently; this announcement marks another step in a notable career in the Medical Services of the Armed Forces. Air Commodore A. A. G. Corbet has been Director of Medical Services in the R.C.A.F. since 1946. He served first with the Royal Canadian Army Medical Corps and transferred to the R.C.A.F. when its Medical Service was organized. Since that time Dr. Corbet has served in all levels of command, including that of Director of Medical Services, R.C.A.F. (Overseas).

During the month of January, Air Commodore A. A. G. Corbet, Director of Medical Services, R.C.A.F. and Group Captain B. C. Coles, Commanding Officer, Institute of Aviation Medicine, R.C.A.F. attended a conference in the United Kingdom with the Surgeon General, U.S.A.F. and D.G.M.S. (R.A.F.) on problems of mutual interest in aviation medicine. A./C. Corbet and G./C. Coles visited certain formations on the Continent prior to their return to Canada at the end of January.

The Advisory Medical Committee of the R.C.A.F. held its quarterly meeting in the Board Room, Medical School, Laval University, Quebec City, Que., on January 26, 27, 1952.

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CONNAUGHT

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# ACTH

## *Adrenocorticotrophic Hormone*

In December 1949, at the invitation and with the financial support of the Federal and Provincial Governments, the Laboratories undertook to produce ACTH in Canada.

Specially collected pituitary glands were obtained across Canada through the helpful co-operation of the Canadian meat-packing industry. The facilities and staff of the Laboratories were applied to the development of methods of production and testing of ACTH, with the result that a product was prepared which met with favourable acceptance. Under the arrangements in effect during the initial period, supplies of ACTH were delivered to the National Research Council of Canada for distribution for research purposes by its Advisory Committee on ACTH and Cortisone. Since August 1950, supplies of ACTH sufficient to meet the requirements of this Committee have been maintained.

It is now possible for the Laboratories to commence limited distribution of ACTH directly to Canadian hospitals, physicians, and research workers.

The Connaught Medical Research Laboratories supply ACTH as a stable, sterile powder, protein in nature and readily soluble in water or saline. It is free from other pituitary hormones or harmful impurities in clinically significant amounts.

Vials containing 10 and 25 Provisional U.S.P. Units are available and other sizes are being contemplated. One Provisional U.S.P. Unit is equal in activity to one milligram of the ACTH supplied through the National Research Council.



**CONNAUGHT MEDICAL RESEARCH LABORATORIES**  
**University of Toronto** **Toronto, Canada**

Established in 1914 for Public Service through Medical Research and  
the development of Products for Prevention or Treatment of Disease.

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## BOOK REVIEWS

## THE DUTCH ARCHIVES OF SURGERY

Subscriptions at \$6.00 may be obtained in Canada from the Oxford University Press, Toronto.

The Dutch Archives of Surgery is now in its third volume. It is a quarterly publication and appears in English. There are French, German and Dutch résumés for the papers. The last issue contained articles on "Diet and Appendicitis", "Lobectomy and Pneumonectomy in Tuberculosis", "Diagnosis and Treatment of Pulmonary Cysts" and "Bullet Wounds of the Spinal Cord and Cauda Equina". A pleasing and convenient sized format adds considerably to the value of this Journal.

## THE THYROID

T. H. McGavack, *Professor of Clinical Medicine, New York Medical College; Director of the New York Medical College, Metropolitan Hospital Research Unit.* 646 pp., illust. \$15.50. C. V. Mosby Company, St. Louis, Mo.; McAtinsh & Co. Limited, Toronto, 1951.

This timely volume is a compilation of today's facts and beliefs concerning the thyroid gland in reasonable compass, yet sufficiently inclusive that nothing important is omitted. The voluminous bibliography is conveniently divided into six parts, one inserted at the end of each section. All the information needed for the intelligent conduct of goitre care is here set forth with special emphasis on the advances in physiological knowledge contained in the latest discoveries in metabolism, biochemistry, radioactive isotopes, and antihistamine drugs.

In the chapter on nodular goitre, although the frequency of cancer in this variety of goitre is emphasized, it is surprising to read that in the author's opinion asymptomatic multinodular goitres may be left alone. This contravenes the orthodox current practice of advising removal of all nodules as prophylaxis against cancer. This diversion from current teaching is partially made up for in the latter part of the book, in a chapter contributed by a surgeon, where return is made to the standard advice to remove surgically all goitrous nodules. This volume ably carries forward the traditions established by the books of de Quervain, Crile and Menas on the thyroid.

(Continued from page 277)

clinical diagnostic work, in the narrowest meaning of the term. That sort of work can only be done properly with close contact with the clinician and his individual patient and it is clearly far outside the field of the public health laboratory. I hope it is not a political manoeuvre, known as "the thin edge of the wedge". I also hope it is not due to lack of inspiration and ability to define their own problems clearly. It is, to a considerable measure, due to a failure of the hospitals to do their bacteriology properly. The question has worried me a great deal and I believe the situation would be vastly improved by discouragement of public health laboratory reports as they are published now. These reports are largely a dull and uninformative enumeration of the thousands of specimens received for examination, and the importance of the laboratory would seem to be judged by the number of ciphers in its grand total of tests performed. Even the most costive-minded statistician must

## SYPHILIS

R. S. Weiss, *Professor Emeritus of Clinical Dermatology, School of Medicine, Washington University; and H. L. Joseph, Consultant in Dermatology and Syphilology, U.S. Air Force Base, Travis Air Force Base, California.* 180 pp., illust. \$5.00. Thomas Nelson & Sons, New York, Edinburgh, Toronto, 1951.

To any one who is interested in syphilis, the book should prove invaluable. This disease is covered in a very clear and concise manner in all its aspects and manifestations, serological, pathological, etc. Treatment old and new is thoroughly discussed. Penicillin is the drug of choice and the method of using it is clearly outlined. The author points out three things that are important. Firstly, that syphilis is primarily a vascular and perivascular disease. Secondly, that a certain percentage of people who have acquired syphilis get better themselves. Thirdly, that for the disease in older people, treatment should be carefully supervised and the dose of any drugs used much reduced in order that harmful effects may be avoided. The reviewer has read it with profit and with pleasure. It brings into the spotlight the old saying "if you know syphilis you know medicine".

## CLINICAL APPLICATIONS OF SUGGESTION AND HYPNOSIS

W. T. Heron, *Professor of Psychology, University of Minnesota.* 116 pp. \$3.50. Charles C. Thomas, Springfield, Ill. The Ryerson Press, Toronto, 1950.

The author gives a description of the general principles of suggestion and hypnosis, and practical advice to physicians, dentists and clinical psychologists on how to apply them. The chapters covered are, in the order given, Suggestions and Suggestibility; Professional Use of Hypnosis; Approach to the Patient; Degree of Hypnotic State; Methods of Induction; Post-hypnotic Suggestions; Precautions in Use of Hypnosis; and finally, Group Hypnosis. In the chapter on Precautions in the Use of Hypnosis it is rightly pointed out that the dangers often ascribed to hypnosis have been over-rated. However, there is a definite risk that neurotic conditions may be obscured by symptomatic treatment. The author stresses the use of hypnosis in dentistry. Perhaps a brief description of the psychodynamics connected with the dental chair might have rounded off the presentation, since dentistry is particularly conducive to suggestive procedures.

be bored by these figures. Substitute for this an informed discussion of problems and judge the importance of the laboratory by the range of its excursions and the depth of its penetration into the unknown or little understood influences contributing to community health.

Even the few examples I have given, in a very small part of the great range of public health, seem to me to sustain my argument that research is as urgently necessary today as ever it was, and the unknown fields are only restricted by the limitation of our power to recognize them. An intriguing feature of the results of the application of new knowledge is that the changes induced by us in our environment require ever-watchful research, whereby we may recognize and correct disadvantageous trends and develop those which are beneficial. That which seems to me hardest for humanity to learn is to keep the power knowledge gives us under the direction of those who understand its meaning and its potentialities.